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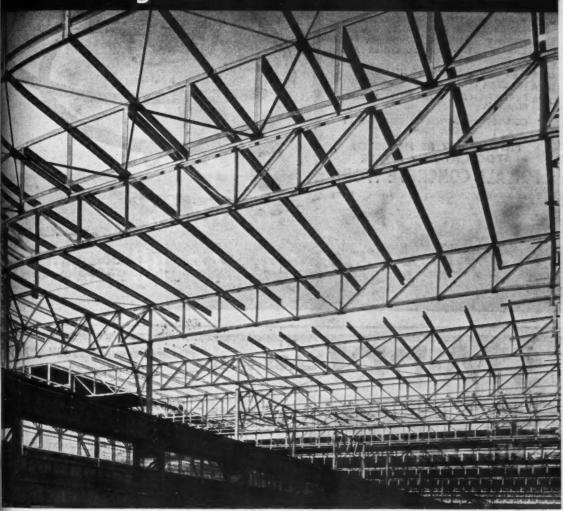
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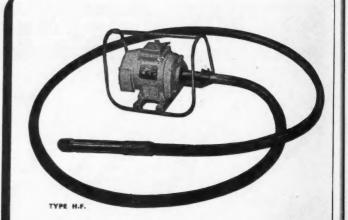
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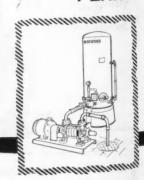
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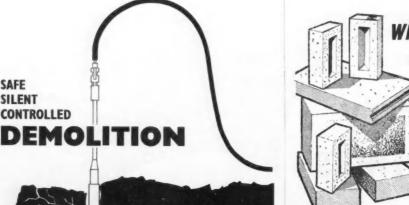
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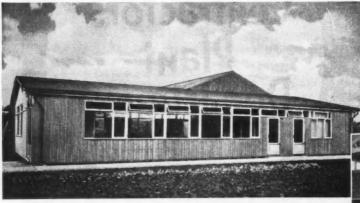
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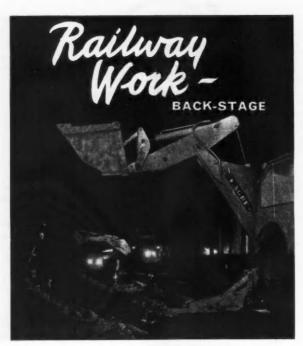
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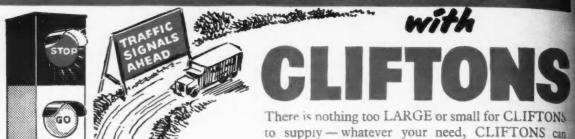
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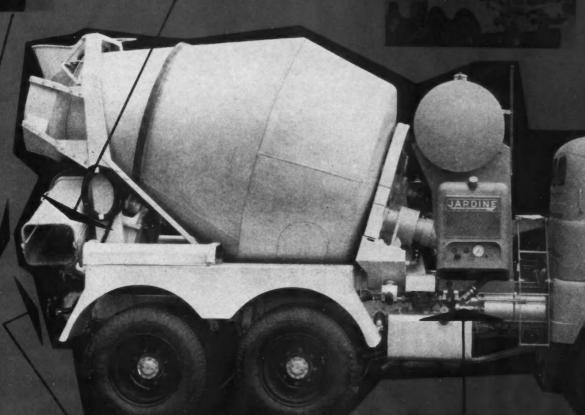
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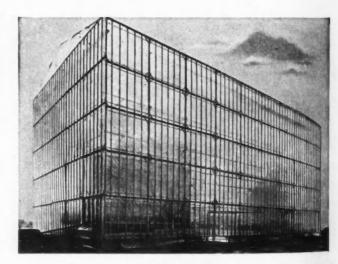
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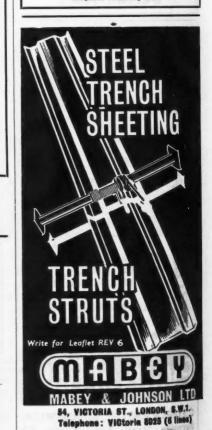
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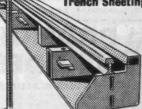
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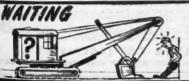
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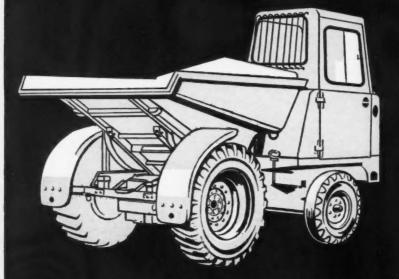
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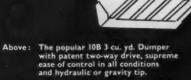
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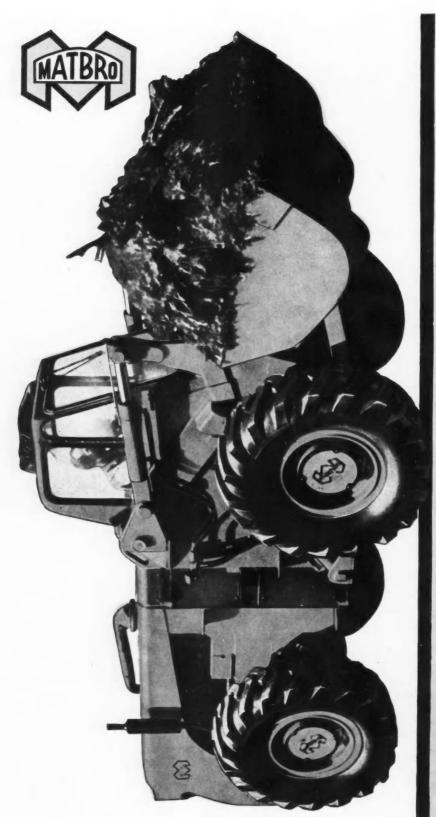
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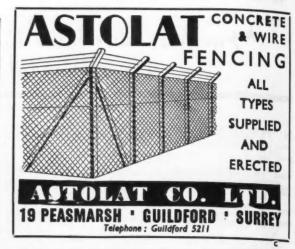
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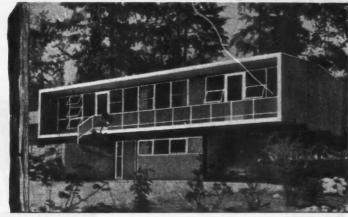
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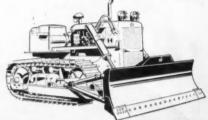
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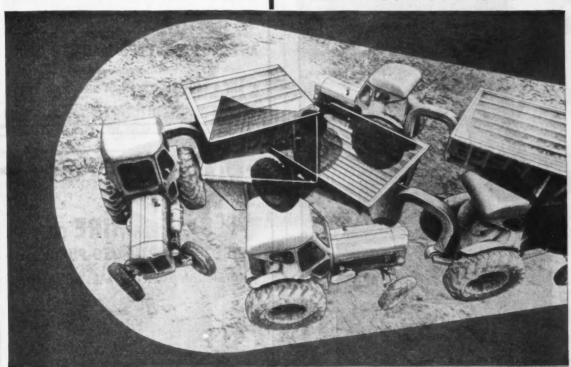
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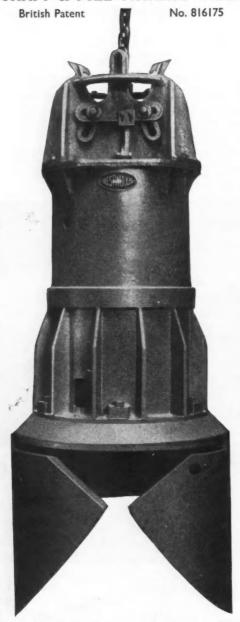
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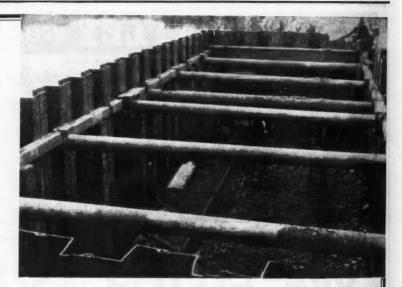
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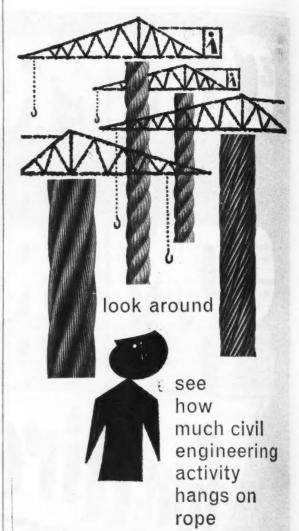
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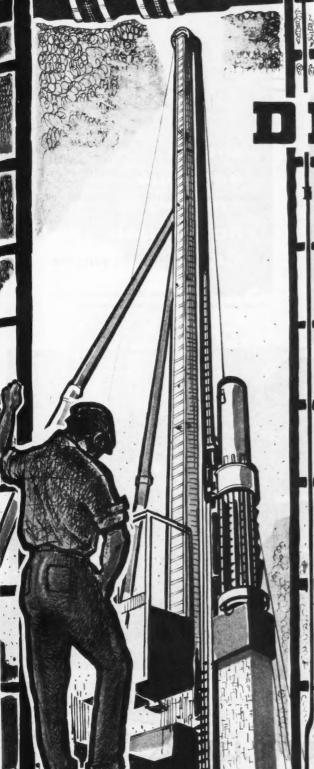
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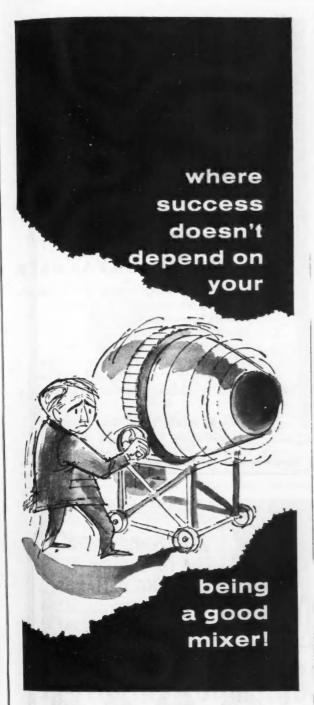
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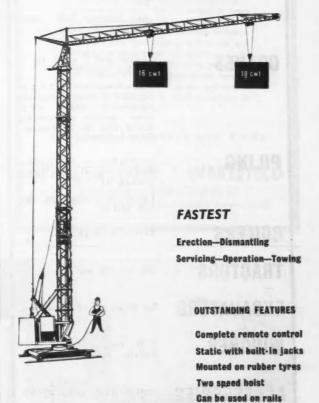
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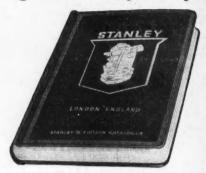
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Surveying Instruments and Equipment Drawing Instruments

Drawing Office Equipment

Drafting Machines Drawing Scales

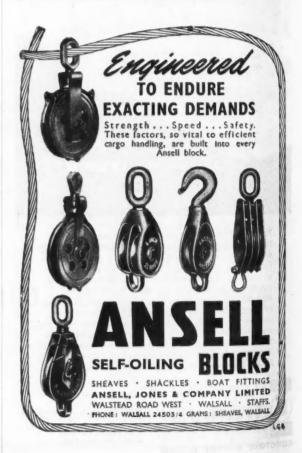
Mathematical Instruments:— Planimeters, Integrators, Integraphs, Harmonic Analysers

Copies of the "A" Catalogue will be sent on request (CJ.A1)

# W. F. STANLEY & Co. Limited

New Eltham . London, S.E.9

Phone: Eltham 3836 Grams: "Turnstile" Souphone, London



1)

# Man with an easy job

He's lucky this week...he's only chilled and stiff. Last month was tougher; then he crawled fifty yards up a twenty-four-inch sewer to clear a valve... forty feet below the surface. He doesn't scare easily. He's a crack frogman of Universal Divers. He's a fully-experienced oxy-arc welder and cutter. He's also been an underwater stonemason. He can carry out a submarine survey in nil visibility. He's skilled in using explosives.

He's one of a team of Universal divers and frogmen who can report anywhere in the British Isles at a few hours' notice. Next time you need a diver in a hurry—send for Universal.

# UNIVERSAL DIVERS LTD



# **SPENCER**

# MESH III

An electrically welded mesh manufactured in accordance with B.S.S. 1221/1945 Part 'A' from High Tensile Steel Wire drawn in our own mill. Oblong or square meshes for concrete reinforcements in floors, foundations, roofs, roads, etc. Standard size sheets and rolls always in stock. Spencer Mesh can also be supplied galvanized. Small meshes are ideal for partitions, fencing, screens, guards and many other applications. Available, if required, in small panels cut to your own specifications.

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Telegrams: SPENCER WAKEFIELD TELEX. Telex No. 55,160

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# SECTIONAL BUILDINGS SITE CABINS & OFFICES



BETTER BUILT . . . BETTER VALUE C & R gives that little extra in design, in materials, in construction.

(Top left)

Multi-purpose building in asbestos or timber Many sizes. Choice of linings.

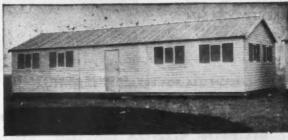
An example of our sheeting service.



Site cabins & offices — a comprehensive range of sizes is available of all timber design—Weatherboard—Tongued and Grooved Board or Plywood cladding being optional.

Write for details to Dept. (C.J.)

C. & R.



CONSTRUCTIONS LTD.

HALIFA)

TELEPHONE : HALIFAX 68191/2

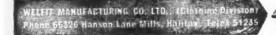


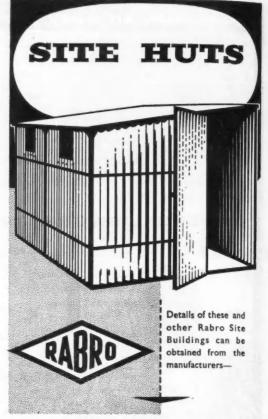
For hardwearing protection it's the Welfit Donkey Jacket, made from showerproof navy Melton cloth. Ideal for industrial workers, it has large patch pockets and is available with or without the leatherette back and shoulders.

Welfit also manufacture a wide range of overalls including warehouse coats, boiler suits, bib and brace overalls, overall jackets and overall trousers — all made from Sanforised shrunk cotton drill in white, navy and khaki.

And don't forget Welfit Waterproof Protective Clothing in P.V.C. and HYDEX—jackets, long coats, leggings, sou'westers, etc. — right for all weathers.

Send for illustrated catalogue showing the complete range of Welfit clothing to:





J. W. RAYLOR & CO. (ENGINEERS) LTD.
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# AVAILABLE FOR HIRE

YOUR SHORT BORE
PILING PROBLEMS.
READY TO TRAVEL
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CHESHIRE HIGHWAY EARTH BORING MACHINE AVAILABLE WITH 9", 12", 14", 16" or 24" AUGERS

ACWORTH (

PLANT HIRE

LTD.

207, HIGH STREET, WALTHAM CROSS, HERTS.

ALSO 'AVAILABLE: DROTTS, DINKUMS, MOBILE COMPRESSORS, 3 YD. DUMPERS & EXCAVATORS



# **PORTABLE CROPPING &** BAR BENDING MACHINERY

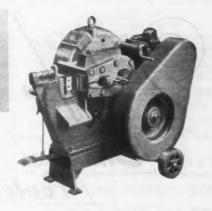


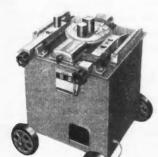
STEELWORKS, STOCKYARDS, ROD MILLS, ETC.

IDEAL FOR REINFORCING BAR WORK

PORTABLE, POWERFUL, COMPACT, HIGH SPEED WORKING

ALL STEEL CONSTRUCTION OF UP TO DATE DESIGN





#### Model CAM Bar Benders

Available in four sizes from 11 or 2" mild steel Model BETON BAR Shears round — foot pedal control — clockwise and anti- Available in five sizes from 1" to 23" clockwise bending with automatic return totally mild steel rounds-clutch control by enclosed gearbox-single and variable speed models -multiple bending of small bars-special equipment available for: Repetition Bending, Stirrup Forming, stroking—gears running in oil—special Bar Straightening, etc.

Sole U.K. Distributors

foot pedal gives single or continuous blades can be fitted for flat bar cropping.

THOS. W. WARD LTD | ALBION WORKS . SHEFFIELD | Telephone: 26311 . Telex: 54-119

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LONDON THAMES ROAD . SILVERTOWN E. 16 . TEL. ALBERT DOCK 2841 BRITON FERRY (GLAM) GIANT'S WHARF . BRITON FERRY . TEL. 3166 GLASGOW FORE ST. · SCOTSTOUN · GLASGOW · TEL. SCOTSTOUN 6355

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# THE NEW ARPS TRENCH DEVIL FOR SALE OR HIRE

Trench widths up to 12" Max. depth 5' 6"

# ALSO AVAILABLE FOR HIRE

ROLLERS from 30 cwt. to 10 tons. VIBRATING ROLLERS

J.C.B. 4s

**DROTTS 4-1 EQUIPMENTS** PRIESTMAN WOLF EXCAVATORS B/A Sk.

MOBILE COMPRESSORS

ALLIS-CHALMERS H.D.6.G. with RIPPERS

ANY OTHER MACHINES AVAILABLE TO ORDER

Write or telephone for further details to:



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# availability

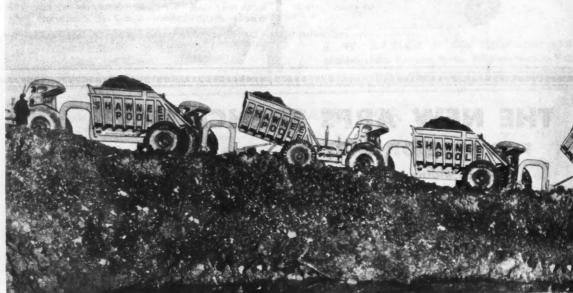


THE SHAWNEE POOLES
GO ON WORKING
WHEN EVERYTHING
IS BOGGED DOWN

User experience has proved an overall availability of 97%. Shawnee Poole continues to operate during the worst conditions even when other forms of transport are completely bogged down. The Shawnee Poole System with the shortest turning circle of any equipment of its kind is the world's simplest and most economical method of industrial and earthmoving haulage.

Ask for a Job Survey on your site.

The Shawnee Poole System is manufactured under British and Foreign patents granted and pending.



# J. D. TRACTORS LTD

CHART ROAD, ASHFORD, KENT

SERVICE—Telephone: ASHFORD 1771
SALES—Telephone: WINDSOR 1913

Your Dealer in: Kent, Surrey, Sussex



HIGHWAYS AND BRIDGES DEPARTMENT.

HIGHWAYS AND BRIDGES DEPARTMENT.

The Council Invite TENDERS for the SUPPLY of UNDERMENTIONED MATERIALS, etc., during the year ending 31st March, 1963:

(1) Tarmacadam, Situmen Macadam and Asphalt Surfacing Materials.

(2) Quarry Stone.

(3) Crushed Gran Materials.

(3) Crushed Gran Bitumen (Cold) Emulsion.

(4) Road rete Goods, Cement, Bricks, Stoneware Pipes.

Tander Forms, with Specification and Conditions of Centract, can be obtained on application to the Country Surveyor, Country Buildings, Worcester, and applicants are requested to state for which item or mess they wish to tender.

The Tender Form, duly completed, must be returned by not later than 22nd JANUARY, 1962.

The Council will not necessarily access the lowest of any feided. W. R. SCURFIELD,

Clerk of the County Council.

ender.

W. R. SCURFIELD,

Clerk of the County Council.

(U.65)

# Shirehall, (U.65) Worcester. Sth December, 1961. BOROUGHOF SHREWSBURY. ANNUAL TENDERS.

TENDERS are invited for the SUPPLY of the FOLLOWING for the year ending 31st March, 1963: Ref.

TENDERS are invited to the acceptance of the control of the contro

S. R. H. LOXTON, Town Clerk.

# BOROUGH OF ENFIELD. ROADWORKS AND SURFACE WATER DRAINAGE. DEVELOPMENT OF ROYAL NURSERIES SITE, GREAT CAMBRIDGE ROAD.

The COUNCIL invites TENDERS for the ABOVE SCHEME, consisting of approx. 300vd. of 24ft. Consisting of approx and approx a

of a bona-fiel render and/or the return of a couments.

Tenders must reach the undersigned not later than Non, McMDAY, 1st january, 1962, and no Tender to the comment of t

# WILLENHALL URBAN DISTRICT

LODGE FARM HOUSING ESTATE. SITE WORKS-STAGE I.

TENDERS are invited on a Fixed-price Basis for the CONSTRUCTION of ROADS and Sowers, and Earthmost and Sowers, and Earthmost and Sowers, and Earthmost and Sowers and Earthmost and Sowers and Earthmost and Sowers and Earthmost and English and Plans and Sections inspected at that Office during normal working hours.

Completed Tenders, in plain sealed envelopes and Sowers Steward Code Farm Siteworks, "should be received by the undersigned not later than MONDAY, the Ish January, 1962. JOHN R. RIDING.

Cierk of the Council.

Town Hall, Willenhall, Staffs.

# DEEPING FEN, SPALDING & PINCHBECK INTERNAL DRAINAGE BOARD.

CONSTRUCTION OF LAND DRAINAGE PUMPING

TENDERS are invited from experienced contractors for the CONSTRUCTION of a PUMPING STATION at PODE MOLE. Spaiding, Lincs., to house two 60in. dia. mis mis 50in. dia. diesel engine drive two 60in. dia. mis mis 50in. dia. diesel engine drive number. The work will include the Construction of the Total Construction. The work will include the Construction of the Total Construction of the Total Construction of a Siulce in Reinforced Concrete and Steel Sheet Piling. Copies of the Contract documents may be obtained from W. D. MILES, A.M.S.E. Engineer to the Board, Desping House, Welland Terrace, Spalding, Lincs., on Syment of a deposit of 55 by cheque made payable to the Deeping Fen Drainage Board. The deposit will be the state of the Construction of the Construct

#### CONTRACTS

WORCESTERSHIRE COUNTY COUNCIL. ISLE OF ELY COUNTY COUNCIL. COUNTY BOROUGH OF BRIGHTON. HIGHWAYS AND BRIDGES DEPARTMENT.

COUNTY ROADS.

TENDERS are invited for the SUPPLY of the UNDERMENTIONED MATERIALS and SERVICES during the 12 months ending 31st March, 1963:—

(2)

Supply and Application of Binder for Surface Dressing.
Supply and Delivery of Chippings, etc., for Surface Dressing.
Supply Deliver and Lay Britumen Macadam.
Supply Deliver and Lay Britumen Macadam with Crushed Rock Aggregate.
Supply and Delivery of Rubble, Rough Pilling.
Surface Dressing Surface Dressing Surface Concrete, Relections, Premixed Watershed Concrete, Relections, Premixed Watershed Roadstone and Building Sand.
Supply and Delivery of Concrete Aggregates, Briting, Watershed Watershed Surface Dressing Surface

Sand.
Supply and Delivery of Cationic Bitumen
Macadam.
Supply and Delivery of Bituminous Road
Emulsion.

(10) Macadam.
(10) Supply and Delivery of Bituminous Road
Famulsiand Delivery of Concrete Kerbs and
Paving Slabs.
(12) Providing and Fixing Reflecting Roadstuds.
(13) Laving Plastic White Lines.
(14) Mire of Mechanical Machines.
(15) Hire of Rollers.
(16) Hire of Rollers.
(17) Hire of Rollers.
(18) Sweeping Cansing and Mechanical Road
Sweeping Cansing and Mechanical Road
Sweeping Cansing and Mechanical Road
(17) Hire of Lorries and Tractors.
(18) Supply and Delivery of Road Paint, Tools,
(19) Supply and Delivery of Concrete Fencing
Polymore and Cansing Concrete Concrete
(20) Supply and Delivery of Concrete Fencing
(21) Heating and Planing
(22) Supply and Delivery of Ready Mixed Concrete
and Lean-mix Concrete.
(23) Supply and Laying of Hot Rolled Gravel
Asphalt and Sand Carpets.
(24) Asphalt and Sand Carpets.
(25) Supply Deliver and Lay Dense Tar Surfacing.
Forms of Tender may be obtained from the County
Survey,
Sealed Tenders, in envelope provided, to be received
by the Clerk of the County Council by Noon on
MONDAY, 22nd January, 1962.
Cierk of the County Council.

R. F. G. THURLOW, Clerk of the County Council. County Hall, March, Cambs, December, 1961

# COUNTY BOROUGH OF DONCASTER. HIGHWAYS CONTRACT NO. 160.

IMPROVEMENT OF BALBY ROAD, A.60.

TENDERS are invited for the WIDENING and RECONSTRUCTION of the ABOVE ROAD between BAINBRIDGE ROAD and KING EDWARD ROAD, the length of approx. 625vd.

The proposed works comprise the Laying of 200 min of the ABOVE ROAD, and the laying of 200 min of of

H. R. WORMALD, Town Clerk.

# BOROUGH OF EALING.

SUPPLY OF MATERIALS AND EXECUTION OF WORKS FOR 12 MONTHS COMMENCING 1ST APRIL, 1962.

IST APRIL, 1962.

Brooms, Brushes and Paint Brushes: Chandlery, Painters' Sundries and Glazing: Bricks, Pipes and Concrete Tubes: Granite, Concrete Kerb and Faving Slabs: Iron Castings and Vertilating Health of Paint Brushes: Chandlery, Painters' Sundries and Glazing: Bricks, Pipes and Concrete Tubes: Granite, Concrete Kerb and Faving Slabs: Iron Castings and Vertilating the Lubricating and Fuel Oils: Shingle, Sand and Ballast, Tarred Macadam: Uniforms, Clothing and Boots; Coal and Coke. WORKS:

Paving Works: Surface Dressing of Roads and Footpaths: Repair of Asphalt Carriageways and Reinstatement of Trench Openings; Window Forms of Tender, Conditions of Contract, etc., may be obtained, and samples inspected, upon application to the Borough Surveyor, Town Hall, Ealing, W.S. Applications for Tender Forms, by post, must be accompanied by a stamped and addressed envelope (brief size).

Tenders must be delivered to the TOWN CLERK, Town Hall, Ealing, W.S., not later than 12 Noon, SATURDAY, 20th January, 1962.

CITY OF STOKE ON TRENT.

HOLDEN LANE FARM HOUSING SITE—CONTRACT NO. 3.

COMPLETION OF STREET WORKS.

The CORPORATION Invite TENDERS for the COMPLETION of STREET WORKS on the ABOVE ESTATE.

ESTATE THE STREET WORKS ON THE ABOVE THE STREET WHITE ABOVE THE STREET WORKS OF THE ABOVE THE STREET WORKS OF THE STREET WORKS

HARRY TAYLOR,

# CONTRACTS

WATER DEPARTMENT.

SOMPTING PUMPING STATION

TENDER'S Invited for MANUFACTURE, DELIVERY, ERECTION, TESTING and MAINTENANCE at TWO DELECTRICALLY DRIVEN SUBMERSIBLE SOREHOLE PUMPS (capacity of station, 2½m. gallons per day, with Control Gear and other apourtenant works. Specification and particulars from Chief Engineer, 12 Bond Strett, Brighton, 1, on payment of £3 deposit, to be refunded on receipt of a bona-fide Tender and return of all documents supplied.

Tenders, in plain sealed envelopes not bearing any name or mark indicating the sender, endorsed "Tender to Pumping Pant—Sompting," to be divered to me by Noon on FRIDAY, 26th January, The Corporation do not bind themselves to accept the lowest or any Tender.

the Corporation do not bind themselves to accept lowest or any Tender. W. O. TODD, Town Clerk.

# BOROUGH OF LUDLOW.

SEWERAGE AND SEWAGE DISPOSAL WORKS.

SEWERAGE AND SEWAGE DISPOSAL WORKS.

TENDERS will shortly be invited for the CONSTRUCTION of WORKS of SEWERAGE and SEWAGE
TREATMENT.
The work will consist primarily of:

(1) Sewage Pumping Station, 221, and 18in dia.
Outrall Sewer (700 lin. yd. approx.).

(2) Sewage Prestment Works comprising—
(a) Inlet and Recorder Channels.

(b) Reinforced Concrete Circular Primary Sedimentation Tanks.
(c) Reinforced Concrete Circular Humus
(d) Rectangular Filter Beds.
(e) Reinforced Concrete Circular Humus
(f) Sludge Drying Beds.
(g) Site Pumping Station, including Office, Stores. Workshop, etc.
(h) Access Road and Site Roads.
(l) Miscellaneous Pipelines, Manholes,
(s) The Restoration of Surfaces and the Maintenance at the compileted Works for a period of 12 months.
Contractors who wish to be included in the list of tendered; and the compileted Works for a period of 12 months.

Contractors who wish to be included in the list of tendered the compileted Works for a period of 12 months.

Contractors who wish to be included in the list of tendered the compileted Works for a period of 12 months.

Contractors who wish to be included in the list of tendered the compileted Works for a period of 12 months.

Contractors who wish to be included in the list of tendered the compileted Works for a period of 12 months.

Contractors who wish to be included in the list of tendered the compileted Works for a period of 12 months. J. P. MOLONY, Town Clerk.

# Municipal Offices, Dinham, Ludlow, Salop. Luft December, 1961. BOROUGH OF REIGATE.

KERBING AND FOOTPATH WORKS-A.23, LONDON-BRIGHTON TRUNK ROAD.

TENDERS are invited for the ABOVE-MENTIONED WORKS, comprising the Removal of 430 lin, yet, existing Kerb, Provision and Laying of 470 lin, yet, Precast Concrete Kerb, and the Resurfacing in Bitumen Macadam of approx. 1,500 sq. yet, Footpath. Tender Forms may he obtained from, and Conditions of Contract Inspected at, the Office of the Borough Engineer and Surveyor conditions are the state of the Contract of the State of the WEDNESDAY, 10th January, 1962.

The Council do not blind themselves to accept the lowest or any Tender.

HEBER DAVIES, Town Clerk.

# Town Hall, Relgate. 14th December, 1961. BOROUGH OF REIGATE. FOUR HOUSES, TYPE M'61, WITH OUTBUILDINGS,

FIXED-PRICE TENDERS are invited for Four HOUSES. Type M/61, with OUTBUILDINGS, based upon Bills of Quantities for sub-structure and site works subject to remeasurement as work proceeds, and upon lump sum for superstructure of the dwellings based upon Specification and Detailed Plans. Form of Tender, Specification Bills of Quantities and Plans obtainable from the Borough Engineer and Surveyor, Town Hall, Relgate, on payment of a a bona-fide Tender or the return of all Plans and documents.

deposit of £2 2s. In the return of au Augustian Sealed Tender or the return of au Augustian Sealed Tenders, in the envelope provided, and sealed Tender for Four Houses, Type M/61, with Outbuildings, "must be returned to the undersigned not later than Noon on TUESDAY, 9th January, 1962.

HEBER DAVIES.

Town Clerk.

Town Hall, Reigate, December, 1961.

# BRIDGNORTH RURAL DISTRIC

AVELEY SEWERAGE AND SEWAGE DISPOSAL.

AVELEY SEWERAGE AND SEWAGE DISPOSAL.

TENDERS are invited for the CONSTRUCTION about 1,750 lin. vd. of GLAZED STONEWARE a SPUN-IRON PIPE SEWERS, 12In., 9in. and 6in. dia., with Manholes and Sewescon Overflow Weltz Sedimentation Tank. Storm Water Tank. Dosing Chamber and Bacteria Bed, Humus Tank, Pumping Station, Stude Lagoons, Pipework, Chambers, Roads, Paths and incidental works, in accordance with the Drawings. Seedification and Bills of Quantities prepared by the Engineers, A. H. S. WATERS AND PARTNERS, of 25 Temple Row, Birmingham, 2.

The Drawings march, Specification, Bills of Quantities prepared by the Engineers, or of the Drawings of the University of the Control of the Control of Tender may be obtained from, the Offices of the undersigned, or of the Engineers, on or atter the Sth january, 1962, on a payment of a deposit of Five Guineas which will be refunded upor acter the Sth january, 1962, on a payment of a decounters.

Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tenders, on the form supplied and in the Sealed Tender and the return of all documents.

G. C. HARRIS, Clerk of the Bridgnorth R.D.C. Westgate, Bridgnorth, Salop. 8th December, 1961.

SUPPLEMENT

# COUNTY OF LINCOLN - PARTS OF BOROUGH OF BARNES.

# HIGHWAYS COMMITTEE.

HIGHWAYS COMMITTEE.

TENDERS are invited for the UNDERMENTIONED or the year ending 31st March, 1963:—

(a) Tarred and Bituminous Macadam, Dense Tar Surfacing, Hot Rolled Asphalt.

(b) Dry Siao, Crushed Stone (Wet Mixed), Limestone, Granite and Pitching Stone.

(c) Paints.

(d) Paints.

(e) Paints.

(f) Traffic Signs and Tubular Posts.

(g) C.I. Road Castings.

(h) Concrete Pipes.

(h) Concrete Pipes.

(ii) Machines.

(iii) Machines.

(iv) Heating and Polaning of Carriageways.

(iv) Heating and Planing of Carriageways.

(iv) Precast Concrete Kerbs and Flags.

(iv) Concrete.

(iv) Conc

and Fittings (Seconds Quality).
(s) Cement.
ecifications, Forms of Tender, etc., obtainable the County Surveyor, County Offices, Sleaford, inders to be received by the undersigned not later the 15th JANUARY. 1962.

the 15th JANUARY. 1962.

the Committee does not bind Itself to accept the st or any Tender.

J. E. BLOW.

county Offices. than

County Offices, Sleaford, Lincs. December, 1961.

# BOROUGH OF WATFORD.

#### CONTRACT FOR MAINTENANCE OF ROADS.

TENDERS are invited for the EXECUTION of SUCH WORKS for the period of nine months commencing on the 1st April, 1962.

Applications for documents must be made to F. C. SAGE. Borough Engineer and Surveyor, Town Hall, Watford, not later than 2 p.m. on THURSDAY, 4th January, 1962.

Contract documents will be forwarded as soon as possible after that date, and tenderers will then be informed of the latest date for the receipt of Tenders.

GORDON H. HALL. Town Clerk

# Town Hall, Watford.

# LEATHERHEAD URBAN DISTRICT

TENDERS are invited for HIGHWAY REGRADING and RESURFACING on the A.243 between WOOD-BRIDGE and "THE LOGH". Leatherhead, including Macadam Carriagewry Surfacing, 5.00 s. yd. Footway Surfacing, and ancillary works.

Documents obtainable from the Engineer and Surveyor's Department, Red House, Leatherhead, where Plans may be inspected.

Tenders to be returned by Noon. 27th JANUARY, 1962.

J. EDE. Clerk of the Council.

# KETTERING RURAL DISTRICT COUNCIL. STOKE ALBANY AND WILBARSTON

TENDERS are invited from suitably experienced contractors for the FOLLOWING WORK at Stoke Albany and Wilbarston, situated between Market Harborough and Corby:

SEWERS—

House Connections.

Tarmacadam Reinstatement of Trenches.

SEWAGE TREATMENT WORKS—

R.C. Screening Chamber and Storm Overflow. One 16ft. square R.C. Vertical Flow Settling

Two 47ft. dia. R.C. Filters.

One 11ft. 9In. square R.C. Vertical Flow Humus Tank.

One 30ft. x 11ft. R.C. Stormwater Tank.

Twelve 27ft. s 8ft. 6in. Concrete Sludge

Concrete Sludge Storage Area.

Pumping Station and Messroom, etc.

Fencing, Pipework, Road, Footpaths, and ancillary works.

Detail Drawings may be seen at the Offices of the Engineers, MESSRS. PICK, EVERARD, KEAY AND Specification, Bill of Quantities and Key Plans may be obtained on payment of a deposit of Five Guineas which will be refunded on receipt of a bona-fide Tender.

Tenders, on the form supplied, and in the envelope provided, are to be delivered to the undersigned not later than 1. Glock in the Forenoon of FRIDAY, 2. The Council do not bind themselves to accept the lowest or any Tender.

A. H. J. CRICK,

Clerk of the Council.

# uncil Offices, London Road, Kettering. 8th December,

# 1961 SOUTH CARDIGANSHIRE WATER

#### MAINLAYING CONTRACT NO. 56

FIXED - PRICE TENDERS are invited from experienced contractors for LAYING of WATER MAINS in Seven extensions in the rural districts of ABERAERON and TEIFISIDE comprising 12,600 vd. of 3in. dia. and 4,200 yard of 2in. dia. Asbestos Cement Pipes together with ancillary works connected therewith

Cement Pipes together with ancillary works connected therewith.

Drawings and contract documents may be obtained, on payment of a deposit of £3, 3s. which will be repaid on the return of the drawings and contract documents and the receipt of a bona-fide Tender not subsequently withdrawn, from H. PROTHERO, Esq., M.A., M.I.C.E., 38 Albano Scuare, Abstractors, Abstracto

# County Offices. Aberystwyth.

#### CONTRACTS

# RECONSTRUCTION OF CASTELNAU, A.306 (PART), CONTRACT VI: AND RESURFACING OF UPPER RICHMOND ROAD WEST, A.205 (PART).

A.205 (PART).

TENDERS are invited for the FOLLOWING:
Reconstruction of part of Castelnau. A.306, including property of Concrete on Glin. of Lean-Mix Concrete; and Burning off and Resurfacing of 4,000 sq. yd. of Burning off and Resurfacing of 4,000 sq. yd. of with 2in. of Hot Rolled Asphalt.

The Form of Tender, Bill of Quantities and Specification may be obtained from the undersigned, to whom they should be returned, in the envelope provided, not later than Noon on the 9th JANUARY, 1962.

W. R. SHEPHERD, A.M.I.C.E., F.R.I.C.S., M.I.Mun.E., Borough Engineer and Surveyor.

Municipal Offices, Sheen Lane, S.W.14. December, 1961.

# BOROUGH OF WREXHAM.

CONCRETE ACCESS ROAD AND FOUNDATION SLAB FIXED-PRICE TENDERS are invited for the ABOVE Drawings and General Control

WORK PRICE IENDERS are invited for the ABOVE WORK to the provision of Contract may be impreted, and Specifications, Bills of Quantities and Forms of Tender obtained from J. M. DAVIES, Borough Engineer and Surveyor, Guildhall, Wrexham, on payment of a deposit of £2 2s, which will be refunded on receipt of a bona-fide Tender. Tenders, in the envelope provided, must be sealed and delivered to the undersigned not later than 12 Noon on MONDAY, 8th January, 1962.

The Council does not bind itself to accept the lowest or any Tender.

PHILIP J. WALTERS. Town Clerk.

# Guildhall, Wrexham. December, 1961.

# BOROUGH OF DARTFORD. SURFACING OF CARRIAGEWAYS AND CONSTRUCTION OF FOOTPATHS, LAYING OF TEMPLE HILL NEIGHBOURHOOD UNIT.

TEMPLE HILL NEIGHBOURHOUD ONTIL.

TENDERS are invited on a Schedule of Prices Basis for the COMPLETION of GENERAL ENGINEERING SITE WORKS at Temple Hill Neighbourhood Unit. The work will include Paving New Footways. Turfing or Grassing of Greens and Verges, Construction of Garage Forecourts and Service Accesses, Surfacing of Accesses and existing Carriageways with Bituminous Material, and ancillary Surface Water Drainage and Kerbing Works. Forms of tender, Condition Contract, Specifica-Forms of tender, Condition obtained on application to the undersigned upon payment of a deposit of Two Guineas which will be refunded on receipt of a bona-fide Tender and the return of all documents supplied other than one copy of the Schedule of Prices.

Prices.

Drawings, showing the proposed extent of the works, may be inspected by appointment at the Offices of the Borough Engineer and Surveyor. Tenders, in plain sealed envelopes endorsed "Works—Temple Hill." but bearing no name or mark indicating the sender, must be received by me not 1962.

1962. iater than 12 Noon on Turbusch.

1962.
The Corporation does not bind itself to accept the lowest or any Tender.

THOMAS ARMSTRONG,

Town Clerk.

# Council Offices, Dartford,

# BOROUGH OF BURY ST. EDMUNDS. WESTLEY ESTATE-CONTRACT NO. 4.

# ROADS, SEWERS AND ANCILLARY WORKS.

ROADS. SEWERS AND ANCILLARY WORKS.
TENDERS are invited for the CONSTRUCTION of
CARRIAGEWAYS and FOUL and SURFACE WATER
The work comprises the Laying of approx. 9,000
The work of the Laying of approx. 9,000
The comprises the Laying of approx. 9,000
The condition of the comprises the compri

RICHARD H. HILES. Town Clerk. Borough Offices, Bury St. Edmunds.

# WINCHESTER RURAL DISTRICT

#### SEWERAGE CONTRACT NO. 5. BURSLEDON SEWERAGE SCHEME.

BURSLEDON SEWERAGE SCHEME.

TENDERS invited from experienced public works contractors for the CONSTRUCTION of about 712 miles of 6in. to 15in. CONCRETE, GLAZED STONE-WARE, ASBESTOS and STEEL SEWERS; about 1 mile of 5in. to 9in. Spun-iron Pumping Mains, four Pumping Stations, and a Sewage Disposal Works for a population of 4,000 personacted, and a copy of the General Conditions of Contract, Specification, Bills of Quantities and Form of Tender obtained after 1st January, 1962, at the Offices of the Consulting Engineers, MESSRS. LEMON AND BLIZARD, Telford House, Huise Road, Southambron, upon receipt of a cheque for Five Guineas made payable to charge of the Consulting Engineers, Enders of the Consulting Engineers, and the form supplied, together with a copy of the priced Bills of Quantities, should be delivered to me, in a plain sealed envelope endorsed "Sewerage Contract No. 5—Burlesdon Sewerage Scheme," by Noon, THURSDAY, 8th February, 1962. The Council does not bind liself to accept the lowest or any Tender.

R. W. PARTINGTON, Clerk of the Council.

Council Offices, 45 Romsey Road, Winchester, Hants.

#### CONTRACTS

# DERBYSHIRE COUNTY COUNCIL

BRIDGES AND HIGHWAYS DEPARTMENT. ROAD IMPROVEMENT AT BORROWASH ROAD (CLASS III), SPONDON.

TENDERS are invited for IMPROVEMENT WORKS, imprising 8,000 cu. yd. Excavation and 1,000 lin. yd.

TENDERS are invited of the county of the value of the county of the value of the county of the count

S. MEHEW, County Surveyor.

# County Offices, Matlock, Derbys.

#### CITY OF OXFORD TENDERS FOR POLICE AND FIRE BRIGADE UNIFORMS.

TENDERS are invited for the SUPPLY of POLICE and FIRE BRIGADE UNIFORMS during the financial Particulars of the articles required, and Forms of Pender, may be obtained from the Chief Gonstable, Central Police Station, St. Aldate's, Orton and from the Chief Fire Officer, George Street Oxford, and from Tenders, enclosed in a plain sealed envelope, and marked "Tender for Police Uniforms" or "Tender for Fire Brigade Uniforms," as appropriate, must reach me at the address given on the Forms of Tender not later than 10.30 a.m. on the 24th JANUARY, 1962.

The Council does not bind itself to accept the lowest or any Tender. HARRY PLOWMAN, Town Clerk.

# Town Hall, Oxford. 21st December, 1961. 21st December, 1961. 31 T Y O F E X E T E R. AREAS RECONSTRUCTION.

# INNER BY-PASS-STAGE VA.

# SIDWELL STREET/BLACKBOY ROAD ROUNDABOUT.

SIDWELL STREET/BLACKBOY ROAD ROUNDABOUT.

The CITY COUNCIL invite TENDERS for the ABOVE WORKS, comprising Demolition of approx. 40,000 cu. rt. of Buildings; the Laying of 290 lin. vid. 18in. and 24in. Foul Sewers, of which 140 lin. vid. are to be constructed in tunnel: 130 lin. yd. of 18in. and 24in. Foul Sewers, of 100 lin. yd. of Concrete Carriageway: 3,000 crete Flagging, together with Trenching. Coaulist Concrete Carriageway: 3,000 concrete C

# Municipal Offices, City, 7 Southernhay West, Excler. Sith December, 1961. TYOF LEEDS. OF LEEDS. Investigation ATION

TENDERS are invited from Soil investigation engineers to CARRY OUT the SOIL INVESTIGATION REQUIREMENTS of the City Architect's Department for a period of 12 months.

Details and Forms of Tender may be obtained from the undersigned on or after the 15th January, 1962, on receipt of a deposit of £1 which is returnable on receipt of the completed Form of Tender.

Cheques to be made payable to the order of Leeds Corporation and crossed "and or Devoteded, properly endorsed should be all the complete of the Town Ciert, Noon on the 1st FEBRUARY, 1962.

The Corporation does not bind itself to accept the lowest or any Tender.

J. R. SHERIDAN-SHEDDEN, City Architect.

# Priestley House, Quarry Hill, Leeds, 9. Sth December, 1961. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. EDGWARE GENERAL HOSPITAL

# NEW CENTRAL BOILER PLANT.

APPLICATIONS are invited from firms wishing to be considered for inclusion in a panel of contractor to be invited to TENDER for the ENGINEERING WORK involved in the installation of the new Central Boiler Plant at the ABOVE HOSPITAL CONOMIC OIL THE INSTALLAND ASSOCIATED ASSOC

COUNTY BOROUGH OF SWANSEA. CAMBRIDGESHIRE COUNTY COUNCIL. TENDERS FOR MATERIALS AND HAULAGE. ROADS AND BRIDGES DEPARTMENT.

TENDERS are invited for the UNDERMENTIONED a period of 12 months from 1st April, 1962:

Bituminous Macadam.

situminous Macadam.
Bricks.
Brooms.
Brosh Refils (Mechanical Sweepers).
Cement.
(Ready Mixed).
Concrete (Ready Mixed).
Concrete Cubes, etc.
Concrete Paving.
Concrete Tubes, etc.
Concrete Materials.
Electric Calose (Street Lighting).
Electric Lamps.
Electric Lamps.
Electric Lamps.
Brook Street Lighting).
Electric Lamps.
Flames.
Hallage. Motor (Daywork).
Haulage. Motor (Daywork).
Haulage. Motor (Daywork).
Haulage. Motor (Connage rates).
Iron and Steel (Bar. Sheet and Tubes).
Lamp Pillars (Steel).
Lamp Pillars (Concrete).
Manhole Covers and Frames.
Oils (Lubricating) and Paraffin.
Petrol and Fuel Oils.
Pipes (Salt Glazed).
Public Lighting Equipment.
Rubber Hose, etc.
Sand and Gravel.
Slag and Apietary Compounds.
Tarmacadam.
Tools and Implements.
Tyres and Tubes.
Waste and Cleaning Rags.
Owns of Tuber and Further particulars may

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Walling Stone.
Walling Stone.
Walling Stone.
Forms of Tender and further particulars may be obtained from the Borough Englineer and Surveyor.
Guidhall, Swansea.
Tenders, in envelopes sealed and endorsed "Tender for —... but which must not bear any name or mark indicating the sender, must reach the understanding the sender, must reach the understanding the sender, must reach the understanding the sender must reach the understanding the sender must reach the understanding the sender post of the sender of the sender of the sender post of the sender of the sen

signed, either by hand (and receipt obtained) or by Registered Post on or before the 24th JANUARY, 1962.
The lowest or any Tender will not necessarily be accepted.

IORWERTH J. WATKINS, Town Clerk. The Guilone Swansea. December,

COUNTY BOROUGH OF READING. BUCKINGHAM DRIVE AND THE MOUNT-

TENDERS are invited for CONSTRUCTION of approx. 1.450 sq. vd. of FOOTWAYS, together with verges and incidental works.

As and Bill of Quantities, etc., obtained for fee of Two Guineas (cheques payable to Reading Corporation) at Borough Surveyor's Office (P.O. Box 17), Town Hall, Reading, Fee refunded for bona-fide Tender, Tenders to be delivered to TOWN CLERK, Town Hall, Reading, by 12 Noon on 18th JANUARY, 1862. No Tender considered unless enclosed in plain saied envelope endorsed Buckingham Drive and The Corporation of sender.

The Corporation of not blind themselves to accept any Tender.

EPPING URBAN DISTRICT COUNCIL

The above Council are prepared to receive TENDERS or the SUPPLY of the FOLLOWING MATERIALS or the year ending 31st March, 1963:—
Sand,
Refined Tar or Tar Compounds (including Spraying and Gritting).
Tarmacadam and Asphalt.
Concrete Kerb.
Cement.

Tarmacadam and A Concrete Kerb. Cement. Coke. Cold Emulsion. Ashes and Clinker.

Ashes and Clinker.
Distember.
Distember.
Derv.
Forms of Tender and all other particulars and domation may be obtained from the Council's distriction of the Council's distriction.
Tenders, on forms provided, enclosed in sealed metobes, endorsed "Annual Contracts," and bearing on name or mark indicating the sender, must be believed to the undersigned not later than 10 a.m. on MONDAY, 22nd January, 1962.

B. HISCOTT.
Clerk of the Council.

Council Offices.
Hawthorn Lodge.
91 High Street.
Epping, Essex.
12th December. 1961.

BASILDON URBAN DISTRICT COUNCIL.

CRICKET AND HOCKEY PAVILION. MOPSIES RECREATION GROUND, BASILDON.

TENDERS will shortly be invited for the ABOVE PAVILION.

Contractors wishing to tender should apply for documents, enclosing \$2 2s. deposit (returnable), to the ENGINEER AND SURVEYOR, Basildon U.D.C., 88 Town Square, Basildon, Essex. Closing 5th JANUARY.

PETERLEE DEVELOPMENT STREET LIGHTING.

TENDERS are invited for the SUPPLY and ERECTION of STREET LIGHTING UNITS, as FOLLOWS:

Section of STREET LIGHTING UNITS, as FOLLOWS:

Surees Road—Contract No. 54A (Completion).

Surees Road—Contract No. 54A (Completion).

Eight G.E.C. Lanterns on Metal Developments and Concrete Utilities Columns (Group "8"),

Chapet Hill: IV—Contract No. 123A.

13 G.E.C. Lanterns on Metal Developments Columns (Group "8"),

Passified Way—Contract No. 133.

41 A.E.I. Lanterns on Stewart and Lloyd Lanteris and Columns (Group "A").

Lanteris and Columns will be ordered by the Corporation and Columns Will be ordered by the Successful Contact the orders transferred to the Successful Contact the Order Stransferred to the Monday Spin Columns (Group "A").

Applications to tender should be received by the Indexistance of the Successful Contact the MonDay Stransferred Strans

A. V. WILLIAMS, General Manager.

Shotton Hall, Old Shotton, Peterlee, Horden, Co. Durham.

#### CONTRACTS

HOT ROLLED ASPHALT-CONTRACT 6120.

TENDERS are invited for SUPPLYING and LAYING BY MACHINE approx. 1,940 tons of BASE COURSE and 820 tons of SAND CARPET WEARING COURSE and 820 tons of SAND CARPET WEARING COURSE and 820 tons of SAND CARPET WEARING COURSE on the County Surveyor, R. LACEY, M.I.C.E., at this address. Tenders, in the envelope provided, must reach the undersigned not later than 9.30 a.m. on MONDAY, 8th January, 1962.

CHARLES PHYTHIAN, Cierk of the Council.

Shire Hall,
Castle Hill,
Cambridge.

COUNTY CHESHIRE COUNCIL.

ROADS AND BRIDGES DEPARTMENT. TENDERS 1962/63.

ROADS AND BRIDGES DEPARTMENT.
TENDERS 1982/63.

TENDERS are invited from firms who wish to be olaced on the County Council's, list of Approved Contractors for the SUPPLY or MATERIALS and SERVICES for the year ending 31st March, 1963, viz. Dry and Coated Stone, Cold Asphalt, Chippings, Gravel, Pitching, Wet-Mix Macadam, Ready Mixed Concrete, Ashes, Pipes, Bricks, Channels and Edging; Grids and Frames, etc., Open Iron Fencing, Tools, Traffic Signs, Lubricating Oil, Paint, Coal, Tar Compounds and Bitumen, Vehicle Tyres, Tarspraying, Hire of Rollers, Hot Rolled Asphalt, Laying Asphalt by Barber-Greene Machine, Heating and Planing and Heating and Sanding Works; and Supply of Labour and certain materials for Plastic White Lines and Laying Particulated for Plastic White Lines and Laying Particulated of Roads and Bridges Department—Tenders 1962/63," to reach the Clerk of the County Surveyor, Backford Hall, near Chester, County Council, County Hall, Chester, not later than 12 the County Council of the Markey 1962, C. G. DAY, C. G. DAY, C. Gounty Surveyor.

Backford Hall, Near Chester. 11th December, 1961.

COUNTY BOROUGH OF GRIMSBY.

HIGHWAYS DEPARTMENT.

TENDERS are invited for the SUPPLY of the UNDERMENTIONED MATERIALS for the period of the period (1) Bitumen Macadam. (2) Sias March, 1963:— (2) Sias Macadam.

(9) oke.
Applications for Tender Forms should be sent to J. V. OLDFIELD, M.Inst.C.E., Bornugh Engineer and Surveyor, Municipal Offices, Town Hall Square, Tenders to be received not later than the 31st JANUARY, 1962.

J. V. OLDFIELD, M.I.C.E., Borough Engineer and Surveyor.
Municipal Offices, Town Engineer and Surveyor.
Grimsby,
Grimsby,
11th December, 1961.

METROPOLITAN BOROUGH OF

SUPPLY OF ROAD MATERIALS, ETC.

TENDERS are invited for the SUPPLY and DELIVERY the UNDERMENTIONED GOODS and MATERIALS d for the EXECUTION of the FOLLOWING WORK r the 12 months commencing April 1st, 1962:—Contract

for the 12 months commencing Contract
No.

(1) Carting of Clay or Rubbish to Shoot.
(2) York and Artificial Paving Slabs.
(3) River Ballast, Sand.
(5) Silver Ballast, Sand.
(6) Tollet Paper.
(6) Tollet Paper.
(9) Ready Mixed Concrete.
Surface Dressing of Carriageways with Hot Bitumen Sorial Office Control of Silver Surface Dressing of Carriageways with Hot Bitumen Sorial Office Control of Tender, which may be obtained from the undersigned, should he accompanied by a stamped self-addressed envelope (large). Tenders must be delivered in the addressed envelopes which will be provided, and by not later than Noon on FRIDAY, January 19th, 1982.

The Council does not bind itself to accept the lowest or any Tender.

Town Hall.

Town Hall.

Town Clerk.

Town Hall, Euston Road, N.W.1 BOROUGH OF DARTFORD.

SURFACE WATER SEWER CONSTRUCTION AND CARRIAGEWAY RESURFACING—ST. VINCENT'S ROAD.

ST. VINCENT'S ROAD.

TENDERS are invited for CARRYING OUT the ABOVE WORKS which will involve Construction of 570 lin. yd. of Sewer in 24in. and 27in. dia. Concrete Pipes and subsequent Reconstruction of 1 mile of 1 m

### CONTRACTS

MINISTRY OF HOME AFFAIRS FOR

TENDERS are invited for the SUPPLY of WATER-PROOF CLOTHING for the Constabulary Forces. Tender Forms may be obtained on application to the SECRETARY, Ministry of Home Affairs, Stormont, Berlast, 4. Preference will be given to firms an the King's National Roli.

GLAMORGAN COUNTY COUNCIL. HIGHWAYS ACT, 1959-PRIVATE STREET WORKS.

HIGHWAYS ACT, 1959—PRIVATE STREET WORKS.

TENDERS are invited for the MAKING GOOD of
the FOLLOWING:

(1) Westminster Crescent (Part) and Sherborne
Avenue (Part), Cyncoed, Cardiff.

To super of the Cardiff.

A super of the Cardiff.

(2) Heol Tyn-y-cae (Part) and Heol Llangan,
Whitchurch, Cardiff.

The principal works comprise: Carriageway.
The principal works comprise to favored to the conditions of the Conditions of the Conditions of Tender, on receipt of a supplied to the Conditions of Tender, on receipt of a supplied to the Conditions of Tender, on receipt of a supplied to the Conditions of Tender, on receipt of a supplied to the Conditions of Tender, on receipt of a supplied to the Conditions of Tender, on receipt of a supplied to the Conditions of Tender, on receipt of a supplied to the Conditions of Tender, on receipt of a supplied to the Conditions of Tender, on receipt of a supplied to the Conditions of Tender, on receipt of a supplied to the Conditions of Contract and Drawings may

supplied.

General Conditions of Contract and Drawings may be seen at the Offices of the County Surveyor during normal working hours.

Contractors will be recognised to pay the recognised rates of wages and to observe the recognised hours

of labour.

of labour.

of labour.

and to observe the recognised hours of labour.

and accompanied by a priced Bill of Quantities, are to be delivered, in the envelope provided, at the control Hall, Cardin, by the First Post on FRIDAY, 1962, addressed to the Clerk of the County Council 1962, addressed to the Clerk of the The County Council do not necessarily accept the lowest or any Tender.

RICHARD JOHN.

RICHARD JOHN.
Clerk of the County Council. County Hall, Cardiff. 11th December, 1961

BOROUGH OF SPENBOROUGH.

MAIN SEWAGE DISPOSAL WORKS.

REPLACEMENT OF FILTER BED DISTRIBUTORS.

TENDERS are invited for the SUPPLY and ERECTION of 20 105ft, dia, and Eight 100ft, FILTER BED DISTRIBUTORS for the Corporation's Main Sewage Disposal Works, situate at HECKMONDWIKE, Coples of Specification obtainable from the Consulting Engineers, Messrs, ARNOLD BROOKSBANK AND SON, 48 Sunbridge Road, Bradford, 1. Tenders, in plain sealed envelopes endorsed Distributors, to reach me by WEDNESDAY, 10th January, 1381.

K. H. CHORLTON, Town Clerk. Town Hall,

URBAN DISTRICT COUNCIL OF

TENDERS FOR MATERIALS AND SERVICES.

TENDERS FOR MATERIALS AND SERVICES.

TENDERS are invited for the SUPPLY of the FOLLOWING MATERIALS and SERVICES for the 12 months endling March 31st, 1963:—

(1) Hardcore and Ashes.
(2) Cold Asphalt.
(3) Refilling and Supply of Mechanical Sweeper Brushes.
(4) Cold Asphalt.
(5) Cold Bituminous Emulsion.
(6) Concrete Flags, Kerb and Edgings.
(7) Motor Haulage.
(8) Salt for Snow Clearing.
(9) Overall Clothing and conkey Jackets.
(11) Local Stone, Sand, Shingle, etc.
(12) Domestic Fuel Oil.
(13) Tar, Tar Compounds and Bitumen.
(14) Tarred and Bituminous Macadam.
(16) Graphic Chlonings.
(17) Mild Steel Dustbins.
(18) Tives, Tubes and Retreads.
Tender documents obtainable from S. A. WADS-WORTH. A.M.I.C.E. M.I.Mur.E. Engignere 2nd.

(18) Tyres, tubes and retreats.

(19) Cement.

(19) Cement.

(19) Comment.

(19)

BOARD. THAMES CONSERVANCY MAIDENHEAD FLOOD RELIEF SCHEME-STAGE 1. CONSTRUCTION OF HIBBERT ROAD BRIDGE.

The Conservators of the River Thames will chortly invite TEMPERS for the CONSTRUCTION of HIBBERT ROAD BRIDGE, Braywick, Maidenhead, Berks. Works will consist of the Consciournes Seams on Pried Foundations and the Recarding and Reconstruction of the Conserver Seams on Pried Foundations and the Recarding and Reconstruction of the Conserver Seams on Pried Foundations. Bit Carriageway over a length of a Flood Relied Channel.

Contractors wishing to tender are invited to write now to the Chiffe Foundation, and the Recarding requesting Drawinss and cocuments when available, and giving brief details or recent experience of works of this nature.

CHELMSFORD CORPORATION

TENDERS are invited for the SUPPLY during the year 1962 of the FOLLOWING CHEMICALS required for treatment as a bublic water supply:

Hydrated Lime.
Tender Forms are available from the Engineer and Manager. Chelmsford Corporation Waterworks. Hall Street, Chelmsford, Essex.

Compoleted Tenders, the submitted to reach the TOWN CERK, Municipal Offices. Duke Street, Chelmsford, Essex, by Noon an 1st JANUARY, 1962.

# SURREY COUNTY COUNCIL.

HIGHWAYS AND BRIDGES DEPARTMENT.

TENDERS are invited for WIDENING SUTTON BY-PASS (A.217), to Dual 24ft. CARRIAGEWAYS, from GANDER GREEN LANE to SUTTON COMMON ROAD (1,100 lin, yd. approx.). Documents, from COUNTY ENGINEER, returnable by 13th JANUARY, 1962, in plain sealed envelope endorsed "Widening Sutton By-pass," to CLERK OF THE COUNCIL, County Hall, Kingston-upon-Thames.

BEDFORDSHIRE COUNTY COUNCIL.

#### HIGHWAYS ACT. 1959. PART IX-MAKING-UP OF PRIVATE STREETS.

# NEW ROAD, BROMHAM.

NEW ROAD, BROMHAM.

TENDERS are Invited for the MAKING-UP of NEW ROAD, Bromham, which is situated approx. The works include the Construction of a Carriage-way with Kerb and Channel, Footpaths, and Suriace Water Drainage.

The Drawings may be inspected during normal office hours and the Office of the County Surveyor, Description of the County Surveyor, Description, Bill of Quantities and Form of Tender may be obtained on the payment of a deposit of Two Pounds which will be returned on receipt of a bona-fide Tender.

Tenders, in the envelope provided, must be delivered to the undersigned not later than 11th JANUARY, 1962.

The Council do not bind themselves to accept the lowest or any Tender.

GEORGE BREWIS.
Clerk of the County Council.

# METROPOLITAN BOROUGH OF

The COUNCIL of the Metropolitan Borough of Greenwich is prepared to receive TENDERS for CONTRACTS, for the year commencing 1st April, 1962, for the FOLLOWING, namely:

(1) Road Materials—Grante Chippings, Crushed Grayel, Precast Concrete Flags, Precast Concrete Kerbs, Ready Mixed Concrete, Bitumen Road Emulsion, Bitumen Macadam, Tarmacadam, Cold Saphali Paying and other Producers. Macadams

Asphalt Paving and other Roadworks, Mastic Asphalt Paving and other Roadworks, Mastic Asphalt Paving and Flooring.

(3) Street Paving Works.
(4) Surface Dressing, Tar, Cut-back Bitumen.
(5) Removal of Rubbish, Ground, etc., from Depots, Ashes and Flou Dust from Street, and Road Sweepings from Depots, Ashes and Flou Dust from Street, Specification, etc., from Depots, Compared to Surveyor, Specification, etc., from Compared to Surveyor, Town Hall, Greenwich High Road, S.E.10.

Sealed Tenders, in the endorsed envelopes provided, must reach the Town Cierk not later than Noon on 17th JANUARY, 1962.

The Council does not bind itself to accept the lowest or any Tender.

G. C. TURK.

G. C. TURK. Town Clerk.

#### OF WATFORD. BOROUGH WATER DEPARTMENT.

# THE GROVE WATERWORKS— BUILDING FOR STANDBY GENERATING PLANT, WORKSHOP, STORES AND OFFICE.

Contractors possessing the necessary experience and wishing to TENDER for the ERECTION of the ABOVE BUILDING, together with incidental works, are invited to submit their names to J. R. COLLINS, A.M.I.C.E., A.M.I.W.E., M.R.S.H., Borough Water Enjoneer and Manager, Town Hall, Wastord, Herts., not later than 2 p.m. on THURSDAY, 1st February, 1962.

3 p.m. on THURSDAY, 1st February, 1962.

4 which will be returnable or the country of the property of the p

GORDON H. HALL. Town Clerk.

# CITY OF CARLISLE.

TENDERS are invited for the FOLLOWING:
(1) Levelling Works—Main Runway.
The work comprises the Scarifying and
Regulating in Bituminous Macadam of
approx. 4,000 sq. vd. and Cold Asphalt
Surfacing of approx. 38,000 sq. vd. of
Main Runway.

Regulating in Bituminous Regulating in Bituminous approx. 4.000 sq. yd. and Cold approx. 4.000 sq. yd. of Saprox. 38,000 sq. yd. of Main Runway.

(2) Surface Dressing to Runways and Perimeter Track.

The work comprises Surface Dressing 38,000 sq. yd. of Runway with 1ain. Chippings and 40,000 sq. yd. of Perimeter Track with 1ain. Precoated Chippings.

The work comprises the Marking of the normal Lines and Letters on two Runways in Hot Applied Superimposed Thermoplastic Marticulars from City Surveyor, 18 Fisher Street.

Closing date: FRIDAY, 5th January, 1962.

H. D. A. ROBETSON, Town Cierk.

#### OF SALFORD. CITY SITEWORKS FOR GARAGES AT FAIRHOPE ESTATE AND RUSHLEY AVENUE.

AND RUSHLEY AVENUE.

FIRM-PRICE TENDERS are invited for the CONSTRUCTION of ROADS, Paths, Forecourts, Drainage and Fencing for Garage Sites at Fairhope Estate (off LANCASTER ROAD), Salford, 6, and Rushley Avenue, Salford, 7.

Copies of the General Conditions, Specification, Bill of Quantities and Form of Tender may be obtained from, and the Drawings of the Works inspected at, Salford, 3, Lanca, and Surveyor's Office, Town Hall, Salford, 3, Lanca, enclosed in the envelope provided, and bearing no other identification, must be delivered to the undersigned not later than 10 a.m. on MONDAY, 8th January, 1962.

R. RIBBLESDALE THORNTON, Town Clerk.

#### CONTRACTS

# COUNTY BOROUGH OF WIGAN.

ANNUAL TENDERS FOR MATERIALS, 1962/63.

TENDERS are invited for the SUPPLY of the UNDERMENTIONED MATERIALS during the financial year ender the Chippings.

(2) Aggregate for Concrete and Building Work.

(3) Pitching Stone.

(4) Tar and Bituminous Compounds for Surface Dressing (supplied and/or applied).

(5) Coated Macadam.

(6) Cold Asphalt.

(7) Dense Macadam Surfacing Materials and Precoated Chippings.

(8) Concrete Flags and Kerbs.

(9) Stone Kerbs.

(10) Ashes,

(7) Dense Macadem
Precoated Chippings.
(8) Concrete Flags and Kerbs.
(9) Stone Kerbs.
(10) Ashes.
(11) Glazed Earthenware Pipes and Fittings.
(12) Concrete Pipes, Manholes and Gulley Pots.
(13) Gulley Grates and Frames.
(15) Cement.
(16) Fabric Reinforcement.
(16) Fabric Reinforcement.
population to the Borough Engineer, Municipal Buildings, Library Street. Wigan.
Tenders, in the envelopes provided, must be received by the undersigned not later than 10 a.m. on 3 The Corporation do not bind themselves to accept the lowest or any Tender, and attention is drawn to the Council's Standing Orders, a copy of which can be seen at the Borough Engineer's Office.

ALLAN ROYLE.

Town Clerk.

Municipal Buildings, Wigan.

#### COUNTY BOROUGH OF BOOTLE. BOUNDARY FENCING TO BOROUGH STADIUM.

BOUNDARY FENCING TO BOROUGH STANDING.

TENDERS are invited for the ABOVE WORK, comprising Supply, Delivery and Erection of approx. 575 lin. yd. of Sin. high Concrete Post and Panel Fencing.

Town Hall, Bootle, 20, Lancs.

Tenders should reach the undersigned not later than 10 a.m. on TUESDAY, 16th January, 1962.

H. PARTINGTON,
Town Clerk.

# CATERHAM A N D WARLINGHAM

# SURFACING OF BUXTON LANE, CATERHAM.

TENDERS are invited for the SURFACING if BUXTON LANE, Caterham, with approx. 3,400 sq. 4d. of 1 sin. thickness of Bitumen Macadam, Caterhae, Caterhae, Caterhae, Caterhae, Caterhae, Caterhae, Copies of the Supplementary Conditions of Contract, Specification, Bills at Quantities and Form of Tender may be obtained on application from, and the Conditions of Contract inspected at. the Office of the Engineer and Surveyor, Council Offices, Caterham, Surrey,

Surrey.

Tenders, in the envelope provided, are to be returned to the undersigned not later than Noon on MONDAY, 8th January, 1962.

B. J. SMERDON,

Clerk of the Council.

Council Offices, Caterham.

# N E W T O W N AND LLANIDLOES

#### PUBLIC CONVENIENCES-LLANGURIG.

Builders and contractors are invited to TENDER for the ERECTION of a PUBLIC CONVENIENCE at Lander ERECTION of a PUBLIC CONVENIENCE at Lander ERECTION of a PUBLIC CONVENIENCE at Lander of the Convenience of the Convenience

GEORGE E. GRAY, Clerk of the Council. 1961

# EAST LOTHIAN WATER BOARD.

TENDERS are invited for LAYING and JOINTING a PIPELINE 12in. dia. for a distance of about 1 mile, and a PIPELINE 10in. dia. for a distance of about 4 mile, and a PIPELINE 10in. dia. for a distance of about 4½ miles, of which 1½ miles is to be completed by May, 1952.

The Drawings may be seen, and the Specification and Laying may be seen, and the Specification of G. Holder obtained, on application to G. H. and Son's (MANCHESTER). Civil Engineers, 51 Mosley Street, Manchester, 2 with a deposit of 55 Ss., returnable on receipt of a bona-fide Tender. Copies of the Drawings are available on payment of 51 1s. which will not be returned.

Separate cheques for these amounts should be made payable to G. H. Hill and Sons (Manchester). Documents and Drawings may also be inspected at the Offices of the Board in Maddington by previous appointment.

Documents and Drawings may also Documents and Drawings may also the Offices of the Board in Haddington by previous appointment. Sealed Tenders, endorsed "Tender for Pipeline 10in and 12in, dia.—Penston to Prestonlinks," to be delivered to the Clerk to the Board, County Buildings, Haddington, not later than 12th JANUARY, 1962. The Board do not bind themselves to accept the lowest or any Tender.

THOMAS GIBB.
Clerk to the Board.

# THOMAS GIBB, Clerk to the Board.

# FYLDE WATER BOARD.

# CONTRACT 160-GUIDE SERVICE RESERVOIR.

TENDERS are invited from experienced contractors for the CONSTRUCTION of a SERVICE RESERVOIR at GUIDE, Blackburn.

The Contract will comprise the Excavation, Construction of R.C. Service Reservoir, and Erection of Aluminium Roof Sheeting, covering an area of 75ft. x 60ft.

Aluminium Roof Sheeting, 75ft. x 60ft.
Further particulars and Tender documents obtainable from ENGINEER, Fylde Water Board, Setton Street, Tenders must be received not later than 15th JANUARY, 1962.

#### CONTRACTS

# CITY AND COUNTY OF BRISTOL, RECONSTRUCTION OF TENNIS COURTS AT WOODLEAZE, SEA MILLS.

TENDERS invited for RECONSTRUCTION of TWO
TENDIS COURTS in One Enclosure, 1,265 sq. yd.
In area, situated at Woodleaze, 5 mills.
Experienced firms may obtain one of Tender
documents from CITY ENGINEER AND PLANNING
OFFICER, Cabot House, Deanery Road Bristol, 1,
Tenders, endorsed "Reconstruction of Tennis
Courts—Woodleaze, Sea Mills," but bearing no mark
indicating sender, must be delivered by 17th
JANUARY, 1962.

#### OF LEICESTER CITY

TENDERS are invited for the CONSTRUCTION at WANLIP SEWAGE DISPOSA CONSTRUCTION at WANLIP SEWAGE DISPOSA BUILDINGS:

(1) Power and Pumphouse Buildings:

(2) Workshop, size approx. 75ft. high.

(2) Workshop, size approx. 75ft. high.

(3) Welfare Block (two-storey block).

(4) Stores, Garages, etc.

(4) Stores, Garages, etc.

(5) Tuton Street, Westminster, Stores, Garages, etc.

(6) Tuton Street, Brighters, MESSRS, J. D. AND Consulting Engineers. MESSRS, J. D. AND Consulting Engineers. MESSRS, J. D. AND Consulting Engineers. MESSRS, J. D. AND Consulting Engineers, MESSRS, J. D. AND Consulting Engineers. MESSRS, J. D. AND CONSULTING ENGINEERS

Town Hall, Leicester.

#### OF LIVERPOOL

TENDERS invited for SUPPLYING and FIXING of HEATING and DOMESTIC BOILERS at WOODLANDS SCHOOL Begenwy, North Wales.

SCHOOL Begenwy, North Wales.

William Buildings, Liverpool, 2
Tenders returnable by 3rd JANUARY, 1982.

Tenders returnable by 3rd JANUARY, 1982.

Town Clerk.

# THE URBAN DISTRICT COUNCIL OF

HAVANT AND WATERLOO.

TENDERS are invited for the CONSTRUCTION of approx. 480 lin. yd. of 12 lin. dia. FOUL SEWER, and ancillary works connected therewith, at WESTERN PARADE, Emsworth.

Conditions of Contract and Drawings may be Conditions of Contract and Drawings may be conditions and Form of Tender may be obtained.

No Tender will be received except in a plain saled envelope which must bear the word "Tender" followed by the subject to which it relates, but shall not bear any name or mark indicating the sender. Tenders must be delivered to the CLERK OF THE COUNCIL TOWN Hall. Havant, not later than 12 Noon on THURSDAY. 11th January, 1962.

The Council do not bind themselves to accept the lowest or any Tender.

# URBAN DISTRICT COUNCIL OF

COULSDON AND PURLEY.

TENDERS are invited for the FOLLOWING WORKS:

(a) Purley Road, Purley—Widening.

(b) Kerbing, Paving and Kerbing, Paving and Carriageway Resurfacing.

(c) Birjaton Road, Hooley—Kerbing, Paving and Carriageway Resurfacing.

(d) Brighton Road, Hooley—Kerbing, Paving and Carriageway Resurfacing.

(d) Brighton Road, Hooley—Kerbing, Paving and Construction and Enlargement of 'Bus Bills of Quantities and Enlargement of 'Bus Bills of Quantities and Forms of Tender, which will be refunded upon receipt of each Tender, which will be refunded upon receipt of bona-fide Tenders.

The Plans, Specifications and Conditions of Contract masks of the Contract masks of th

ERIC F. J. FELIX. Clerk of the Council. Council Offices. Purley, Surre

#### HERNE BAY URBAN DISTRICT COUNCIL. ROSELEA AVENUE.

ROSELEA AVENUE.

TENDERS are invited for the FOLLOWING WORKSCONTRACT NO. 1—Making-up of the agent of the control of the cont

Council Offices, Herne Bay.

# NORTH EAST WARWICKSHIRE WATER BOARD.

SCRAPING OF SMALL-DIAMETER WATER MAINS.

TENDERS, to be received not later than 10 amon WEDNESDAY, 17th January, 1962, are invited for SCRAPING approx 8,000 lin, yd, of SMALL-DIAMETER WATER MAINS.
Specification and Bills of Quantities are obtainable from the undersigned on payment by cheque of a deposit of £2 2s.

Engineer and Manager.

Pool Bank Street.

Pool Bank Street, Nuneaton

HUNTINGDONSHIRE COUNTY COUNCIL. TENDERS FOR MATERIALS, SURFACE DRESSING,

PLANT HIRE, ETC. DRESSING,
TENDERS are invited for the UNDERMENTIONED
ITEMS for the financial year ending 31st March, 1963;
Bituminous Macadam (Supplied and Delivered).
Bituminous Macadam (Supplied, Laid by Machine and Rolled).
Hot Asphalt (Supplied, Laid by Machine and Rolled).
To an and Bituminous Veneers (Supplied Applied and Delivered).
Tar and Bituminous Surface Dressing.
Provision and Laying of Plastic White Lines.
Refecting Roadstuds (Laid only).
Roadstone.
Sand and Graval.

Cold Asphalt and Bituminous Vene and Delivered).

Tar and Bituminous Surface Dressin Provision and Laying of Plastic Wh Reflecting Roadstuds (Laid only). Roadstone. Gravel.

Roadstone. Gravel.

Tar and Bituminous Compounds. Ware Pipes and Guilles.
Concrete Tubes.
Concrete And Granite Kerbs.
Concrete Paving Flags.
Concrete Paving Flags.
Coment.

Hire of Road Rollers.
Hirs of Excavating and other Plant.
Road Traffic Signs.
Road Traffic Signs.
Coal and Code

Hire of Noss.

Hire of Excavating and other risks.

Hire of Excavating and other risks.

Hire of Excavating and other risks.

Road Action Colors and Frames, Gully Gratings and Coke.

Manhole Covers and Frames, Gully Gratings and Frames.

Forms of Tender may be obtained on application for Mr. R. E. C. Gorling, B.Sc.(Eng.), A.M.I.C.E., County Surveyor. Walden House, Huntingdon, Note of the County Surveyor.

Henders must be signed and deflivered to the undersigned on or before 17th JANUARV. 1962, in the evelope supplied, which shall be sealed and which shall not bear or reserve the right tenders have between two or more contractors, and do not bind thesmelves to accept the lowest by any Tender.

A. C. AYLWARD.

County Buildings,

County Buildings,
Huntingdon.
18th December, 1961.
COUNCIL OF DURHAM. COUNTY COUNCIL TENDERS Invited for SUPPLY of MACHINE SHOP, SHEET METAL and WELDING EQUIPMENT to HEBBURN TECHNICAL COLLEGE. Forms of Tender, returnable by 5th JANUARY, 1962, and details from undersigned.

G. H. METCALFE,
Director of Education.

Shire Hall, Durham. 11th December, 1961.

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RE

COUNTY DORSET.

POLICE CLOTHING.

The DORSET STANDING JOINT COMMITTEE lavite TENDERS for the SUPPLY of CLOTHING. Including Shirts. Collars and Ties, for the DORSET CONSTABULARY.

CONSTABULARY.

TONE TO THE CONSTABULARY HEADQUARTERS, DOTCHESTER.

Sealed Tenders, endorsed "Tender for Police Clothing," must be received by me by the 18th JANUARY, 1962.

The Committee do not bind themselves to accept he lowest or any Tender.

Clerk of the Standing Joint Committee.

County Hall.

Dorchester.

18th December.

thy Han.
orchester.
13th December, 1961.

T Y O F S A L F O R D.

SUPPLY OF FENCING AND GATES.

TENDERS are invited for the SUPPLY and DELYERY of WROUGHT-IRON FENCING and GATES. For O.D. MANCHESTER GOLF COURSE, in accordance with particulars to be obtained from the Directors of Parks, Buile Hill Park, Salford, 6.
Tenders, in sealed envelopes, addressed to the CHARMAN, Parks, etc., Committee, Town Hall, Salford, 3, and endorsed "Fencing and Gates—Old Manchester Golf Course," should be forwarded to arrive not later than 30th DECEMBER, 1961.

RAINFORD URBAN DISTRICT COUNCIL. ROAD MATERIALS FOR YEAR ENDING MARCH 31ST, 1962.

TENDERS are invited for SUPPLY of BROKEN STONE, ASHES, CONCRETE FLAGS and KERBS, TARMACADAM, EARTHENWARE PIPES, GULLIES,

Particulars and Forms of Tender can be obtained from the Surveyor, Council Offices, Rainford, upon recipit of a stamped addressed envelope. Tenders, endorsed "Tender for Road Materials," in a plain seaded envelope bearing no name or mark indicating sender, to be in my hands by FRIDAY, laurary 12th, 1962.

The Council do not bind themselves to accept the lowest of any Tender.

N. ASHURST. Clerk to the Council. 1961

ASHFORD (KENT) URBAN DISTRICT

TENDERS are invited for the SUPPLY of the IDERMENTIONED MATERIALS and SERVICES for the treat ending 31st March, 1963:—

Contract
National Contract
Nat

#### CONTRACTS

ADMIRALTY.

N.A.T.O. COMMON INFRASTRUCTURE SLICES V. VIII AND IX.

NAVAL BASE INSTALLATIONS. (Reference: INFRA 33/1/2/3 AC/4(PP)D 3706.)

(Reference: NFRA 33/1/2/3 AC/4(PP)D 3706.)

FINAL NOTICE is hereby given that international Competitive BIDS will be invited on or about 22nd March. 1962. for the DESIGN and CONSTRUCTION of STEEL MASTS and Towers, together with their Foundations, for a Radio Station in Maita.

2. The Contract will comprise Design and Construction of the following Masts and Towers, and of their roundations of Anchorages.

3. The John Steel Towers, ranging from 120ft. to 200ft. in height.

3. The approx. value of the works is £100,000, and construction will be required to be completed within 21 months of award of the Contract.

4. It should be noted that importation of labour from snurzes outside Maita may be subject to restriction, and that permission could in any case only be given on the undertaking that the contractor would pay value of wages and observe hours and conditions and the stational country and the second to make the contractor would pay value or wages and observe hours and conditions for the contractor would not the contractor of t

given on the undersame that the pay rates of wages and observe hours and conditions of work, not less favourable than those established in the pay rates of wages and observe hours and conditions of work, not less favourable than those established in 5.

5. The closing date for receipt of Bids will be 15.

5. The closing date for receipt of Bids will be 25th JANUARY, 1962.

6. Firms wishing to bid must formally notify their desire by applications to bid firms wishing to be invited must be applications to bid firms wishing to be invited must be applications to bid firms wishing to be invited must be applications to bid firms wishing to be invited must be applications to bid firms wishing to be invited must be applications.

(i) Statement of financial esources and evidence of financial stability.

(ii) Details of recent major contracts completed for work of a comparable nature, and an indication of the value of each.

8. Inquiries regarding bidding should be addressed to DIR and the payor of th

iralty, ondon, S.W.1. December, 1961.

BOROUGH OF ACTON.

The TOWN COUNCIL Invites TENDERS for SUPPLYING during the year beginning 1st April, 1962. the FOLLOWING:
Artificial Stone Paving.
Brooms and Brushers and Er. Stag Chippings.
Sprinter and E.F. Stag Chippings.
Sprinter and E.F. Stag Chippings.
Tenders, in sealed envelopes appropriately endorsed, must be delivered to the TOWN CLERK. Town Hall, Acton, W.S., by 15th JANUARY, 1962.

MANCHESTER. CITY OF HOUSING COMMITTEE.

TENDERS are invited (returnable Noon, 2nd JANUARY, 1962) for the DEMOLITION and CLEAR-ANCE of 283 PREMISES, including Houses, Shops, Workshops, Licensed Premises, in the RODNEY STREET, ANCOATS, CLEARANCE AREA.

Documents obtainable from the DIRECTOR OF HOUSING, Town Hall, Manchester, 2.

URBAN DISTRICT COUNCIL OF

PROPOSED EXTENSION TO GLOUCESTER ROAD, KIDSGROVE.

TENDERS are invited for ROADWORKS, consisting of approx. 3.500 cu. vd. Excavation. 1,710 sq. vd. of Sin. Ash, 9in. and 12in. Pitching, 3in. Base Coat and Topping, together with all necessary Kerbing, Footpaths and Drainage.
Specifications, Bills of Quantities and Forms of Tender may be obtained from the Engineer and Surveyor, Town Hall, Kldsgrove, Staffs., on payment receipt of a bona-fide Tender. The Drawlings may be inspected at the Office of the Engineer and Surveyor during normal office hours.

Tenders, in plain sealed envelopes supplied, endorsed "Gloucester Road Improvement," must be returned to the undersigned not later than Noon on THURSDAY, the 18th January, 1962.

The Council does not bind liself to accept the lowest or any Tender.

B. V. TAYLOR.

B. V. TAYLOR, Clerk of the Council. Town Hall, Kidsgrove, Staffs. 14th December, 1961.

BATHAVON RURAL DISTRICT COUNCIL. TENDERS.

HOLCOMBE LANE, BATHAMPTON, NEAR BATH.

(A) OLD PEOPLE'S DWELLINGS AND WARDEN'S BLOCK.
(B) 22 TRADITIONAL THREE-BEDROOM HOUSES.

TENDERS are invited from experienced contractors the PROPOSED WORKS, consisting of the for the PROPOSED WORKS,
for the PROPOSED WORKS,
FOLLOWING:
CONTRACT "A"—Erection of 15 Single-storey
Dwellings 2 Blocks of 6 Flats, 1 Block of
6 Flats, and a Warden's House comprising
a communal metting room and flat, together
with Paths, Siteworks and all Domestic

Services "B"—Erection of 22 Traditional type Three-bedroom Houses, together with Paths, limited Siteworks and all Domestic

CONSTITUTE THE STATE OF THE COUNCIL OF THE STATE OF THE

S. G. FOXTON PRICE, Clerk of the Council.

Council Offices, Westgate Buildings,

#### CONTRACTS

NOTTINGHAMSHIRE COUNTY COUNCIL. HIGHWAYS AND BRIDGES DEPARTMENT. ELIMINATION OF STURTON-LE-STEEPLE LEVEL CROSSING.

TENDERS are invited for the CONSTRUCTION of a BRIDGE. Approach Embankments, and ancillary works required for the Elimination of the Sturton-le-Steeple Level Crossing, comprising the FOLLOWING:

(a) Encased Steel Beam and Cellular Reinforced Construction of the Sturton-le-Steeple Level Crossing, comprising the FOLLOWING:

(b) Earthworks in forming approach embankments—max. height 25th.

(c) Roadworks over embankment and bridge.

The Form of Tender and Contract documents may be obtained from the County Surveyor, Shire Hall, No Contract document of £10 deposit by cheque which will be contract document of £10 deposit by cheque which will be contract documents.

Tenders, in the envelopes provided, should be contract documents.

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Tenders of the County Council Council does not bind itself to accept the lowest or any Tender.

A. R. DAVIS,

Clerk of the County Council Council Clerk of the County Council Council Council Council Clerk of the County Council Council Clerk of the County Council Council Clerk of the County Council Clerk of

COUNTY BOROUGH OF DUDLEY.

ERECTION OF 22 DWELLINGS.

Applications are invited from building contractors to be included in a list of contractors from whom TENEERING. In pairs of the ERECTION of 22 DWELLINGS. In pairs of the process and bocks of two storey flats, all in traditional construction, in OAK STREET.

DWELLINGS, in pairs or most participations of the storey flats, all in traditional construction, in GAR STREET, Applications to tender must be submitted to the Borough Architect, S Ednam Road, Dudley, Worcs, not later than MoNDAY, 1st January, 1962, and not later than MoNDAY, 1st January, 1962, and participation of the state of

The Council House, Dudley, Worcs.

13th December, 1961.

COUNTY BOROUGH OF BLACKPOOL.

TENDERS (by 2.30 p.m., FRIDAY, 12th January, 1962) for the IMPROVEMENT of WESTCLIFFE DRIVE, comprising the Conversion of approx. 250 lin. yd. of Single Carriageway to Dual Carriageway to Lincluding Accommodation Works.

Particulars, etc., from BOROUGH SURVEYOR, P.O. Box 17, Municipal Buildings, Blackpool, on payment of £2 deposit.

ITY OF YORK

STREETS AND BUILDINGS COMMITTEE.

TENDERS are invited for the MAKING-UP of OAKLAND AVENUE for a length of 107 lin. yd., from its junction with Hempland Avenue, comprising Relaying of the Footpath, Kerb, and other incidental works.

laying of the Footpath, Kerb, and other incidental works.

The General Conditions of Contract and Drawings may be inspected at, and the Specification, Bills of Quantities and Form of Tender obtained from, the Office of the undersigned, on payment by cheque (made payable to York Corporation) of £2 which will be retunded upon receipt al a bona-field Tender not subsequently withdrawn.

The completed Form of Tender shall be delivered to the undersigned, in the official printed Tender envelope, scaled and endorsed "Oakland Avenue—Private Street Works," not later than Noon on TUESDAY, 9th January, 1962.

The lowest or any Tender will not necessarily be accepted.

CHAS. J. MINTER. City Engineer, Surveyor and Planning Officer.

7 St. Leonard's Place, York.

FRIERN BARNET URBAN DISTRICT CONSTRUCTION OF HOUSING SITE ACCESS ROAD.

TENDERS are invited for the CONSTRUCTION of 120yd, of CONCRETE CARRIAGEWAY, with Kerbing and Road Guilles, at EAST CRESCENT, N.1.
Drawings may be seen at, and Tender documents obtained from, the Office of the Engineer and Surveyor. Town Hall, Friern Barnet, N.11.
Tenders, in the envelopes provided, bearing no indication of the sender, are to be delivered to the undersigned not later than Noon on TUESDAY. The 9th JANUARY, 1962.

R. S. CLOTHIER,
Clerk of the Council.

DISTRICT COUNCIL. URBAN WATER SUPPLY.

CONTRACT NO. 4-WATER TOWER AND BOREHOLE PUMPING STATION.

BOREHOLE PUMPING STATION.

TENDERS are invited on a Fixed-price Basis for the WORK REQUIRED in the CONSTRUCTION of a 20,000-gallon Reinference Pumping STATION.

Tollow a single state of the Construction of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, or at the Office of the Engineers, Diss. Norfolk, Diss.

C. R. WILLIAMSON, Clerk of the Council.

SUPPLEMENT

# BOROUGH OF BARNSTAPLE.

ANNUAL TENDERS 1962/63.

TENDERS are invited for the SUPPLY of the FOLLOWING ITEMS for the 12 months ending on 31st March, 1963:

Conditions of Contract, Forms of Tender, etc., may be obtained from the Borough Surveyor, The Castle, Barrataple, to whom completed Tenders (in the Montract and Batch Concrete.)

(2) Plaster, Plasterboard. Pyruma Fire Cement.

(3) Plaster, Plasterboard. Pyruma Fire Cement.

(5) Gravel and Sand.
(6) Glazed Stoneware Products.
(7) Timber.
(8) Petrol and Diesel Oil.
(9) Lubricating Oils.
(10) Parafin.
(11) Concrete Products and Batch Concrete.
(12) Castlings. Nails, Hinges and General Iron-mongery.
(14) Scavenging Brooms.
(15) Paints and Decorators' Materials.
(16) Disinfectants and Toilet Paper.
Conditions of Contract, Forms of Tender, etc., may be obtained from the Borough Surveyor, The Castle, Barnstaple, to whom completed Tenders (in duplicate) are to be sent, in the envelope provided, by 25th JANUARY, 1950.

F. J. BROAD, Town Clerk.

# The Castle, Barnstaple. 11th December, 1961. 200 IJGH OF CONWAY. BOROUGH OF CO SUPPLY OF MATERIALS.

SUPPLY OF MATERIALS.

CONWAY BOROUGH COUNCIL invite TENDERS for the SUPPLY of the FOLLOWING MATERIALS:
Copper Tubing: Plumbers' Solder: Toilet Rolls; Fireclay Sinks: Cistern Floats and Valves; Mop Heads Fourth Soap Coap Heads Fourth Soap Coap Heads Fourth Soap Coap Copper Cylinders; Petrol and Olis; Paints; Copper Cylinders; Petrol and Olis; Paints; Putty; etc.

Detailed list and Form of Tender may be obtained on application, by letter, to the Borough Engineer, Municipal Offices, Bodiondeb, Conway.
Scaled Tenders should be conveyed to the undersiged of Tenders and Float Foots of SATURDAY, 20th January, 1962, endorsed "Materials."

Town Clerk's Office,

# Town Clerk's Omco. Bodlondeb, Conway. 15th December, 1961. T Y O F L E E D S.

# PROPOSED HORSFORTH VALLEY RELIEF SEWER.

PROPOSED HORSFORTH VALLEY RELIEF SEWER.

TENDERS are invited by the TOWN PLANNING AND IMPROVEMENTS COMMITTEE for the CONSTRUCTION of a NEW SEWER in Reinforced Concrete Ploes 35in. Internal dia., approx. 63.3 lin. yd., and NEW SEWERS in Unreinforced Concrete Ploes varying in size from 12in. to 15in. Internal dia., approx. 45 lin. yd. in length, and including Manholes and incidental works.

Plans, Specification. Conditions of Contract, Bill of Plans, Specification. Conditions of Contract, Bill of Plans, Specification of Tender may be obtained on application to Room No. 75. Civit Hall, Leeds, 1, on payment of a deposit of £2 2s. which will be returned upon the receipt of a bona-fide Tender, together with all documents supplied. Tenders and all documents supplied. Tenders and all documents shall be completed and rowarded, in accordance with the detailed instructivic control of the proposition of t

# LEYLAND URBAN DISTRICT COUNCIL. TOWN CENTRE ROAD.

CONTRACT NO. 1.

TENDERS are invited for the ABOVE CONTRACT. The works include the Construction of approx. 450yd. of Wermix and Asphalt Roadway, including Kerbing and Flagging, and the Construction of approx. 400yd. of Surface Water Sewer.

Drawings may lise inspected at the Office of F. D. HOWE, M.I.Mun.E., Engineer and Surveyor, Council Offices, Leyland, from whom documents and Form of the Council of St. 2. 2s. which will do no apprenent of a deposit of 22. 2s. which will do no apprenent of a deposit of the Council of St. 2. 2s. which will do not apprenent of a deposit of the Council of the University of the Council Offices, Levalad Lances

Council Offices, Leyland, Lancs. December, 1961.

# LEYLAND URBAN DISTRICT COUNCIL.

#### PEACOCK HALL ESTATE. CONTRACT NO. 1.

TENDERS are invited for the ABOVE CONTRACT. The works include the Construction of approx. 200yd. of Tarmacadam and Hardcore Roadway, including Kerbing and Flagging, and the Construction of 300yd. of Surface Water Sewer.

Drawings may be inspected at the Office of F. D. HOWE, M.I. Mun.E., Engineer and Surveyor, Council Offices, Leyland, from whom documents and Form of Concession of Surveyor, Council Offices, Leyland, From whom documents and Form of Surveyor, Council Offices, Leyland, From whom documents and Form of Surveyor, Council Offices, Leyland, From Whom documents and Form of the Council of Surveyor, Council Offices, Leyland, From Whom documents and Form of the Council of Surveyor, Council Offices, In a plain sealed envelope, and endorsed Peacock Hall Estate," must be delivered to the undersigned not later than 12 Noon on WEDNESDAY, the 10th January, 1962.

The Council does not bind itself to accept the lowest or any Tender.

W. C. F. GODSELL,

W. C. F. GODSELL, Clerk of the Council.

Council Offices, Leyland, Lancs. December, 1961.

#### CONTRACTS

# BOROUGH OF

TRING ROAD CEMETERY EXTENSION.

TRING ROAD CEMETERY EXTENSION.

FIXED-PRICE TENDERS are invited for EXCAVATING, LEVELLING and SEEDING approx. 22,000 sq. vd., together with ancillary works, including Drainage, Footpath Construction and Alterations to Mess Hut. Plans and Conditions of Contract may be seen at, and Bills of Quantities and Specification obtained (corott." 3 Oxford Road Aversable, upon payment of a deposit of Two Guineas, returnable on receipt of a bona-fide Tender.

Tenders, in a plain sealed envelope, endorsed "Cemetery Extension," must be delivered to the under signed on the corotter of the corotter o

R. D. W. MAXWELL, Town Clerk.

# BOROUGH OF ILFORD.

WILTON ROAD SURFACE WATER SCHEME.

WILTON ROAD SURFACE WATER SCHEME.

TENDERS are invited from contractors with considerable experience in large drainage works, for the LAYING of approx. 1.180yd. of CONCRETE TUBES from 45in. to 18in. dia., the Construction of a Reinforced Concrete River Outfall, and ancillary works.

Specification and filling special Conditions of Contracts. Specification and Filling Special Conditions of Contract in Special Conditions of Contract in Special Conditions of Contract inspected at, the Office of the Borough Engineer during normal office hours (S-day week) am payment of a deposit of Two Guineas which will be refunded on receipt of a bona-fide Tender not subsequently withdrawn.

Tenders, in a plain sealed receipt and endorsed "Tender Wilton Road Surface Water Scheme," accompanied with the names of Authorities for whom the tenderer has carried out works of a similar nature, must be delivered to the TOWN CLERK. Town Hall, liferd, not later than 4 p.m. on TUESDAY, 23rd January, 1962.

# C I T Y O F LEICESTER. DEMOLITION AND CLEARANCE WORKS COMPULSORY PURCHASE ORDER, 1959.

LEICESTER CORPORATION AREAS

FIXED-PRICE TENDERS are invited from experienced contractors for the DEMOLITION and CLEAR-ANCE of 159 PROPERTIES in Birstall Street, Willow Street, Little Brunswick Street, Brieriey Street and Curzon Street, consisting of Terraced Blocks of Houses. Full details and Forms of Tender are obtainable from the undersigned on payment of One Guinea, refundable on receipt of a bona-fide Tender. Tenders are to be returned, in the official envelope provided, by 4.30 p.m. on FRIDAY, 12th January, 1962.

JOHN L. BECKETT, M.I.C.E., City Surveyor.

# BEESTON AND STAPLEFORD

Separate TENDERS are invited for the FOLLOWING: 18in. dia. Relief Foul Sewer—Stapleford. The work consists of Providing, Laying, Bedding and Haunching 1,600 lin. yd. of 18in. dia. Concrete Pipes laid at an average depth of 8ft. through the Washlands to the River Erewash, and 25 lin. yd. of 36in. dia. Pipes laid in tunnel beneath Trunk Road. A.52.

depth of Bit. Miller River Erewash, and 25 lin. yu. River Erewash, and 25 lin. yu. A. 52.

A. 52.

Box C. West Consists of Excavating and Laying 200 lin. yd. of 6ft. x 4ft. Precast Concrete Box Culvert Sections (supplied in separate contract) along or near to the line of existing watercourse, together with ancillary works of In-situ Reinforced Concrete Intake and Discharge Aprons. Bills of Quantities and Forms of Tender may be obtained upon a deposit of Two Guineas for each scheme. The deposit is returnable upon receipt of a bona-fide Tender not subsequently withdrawn.

Each Tender to be returned to the undersigned, in a plain scaled enversion. The contract of the plain scaled enversion. The contract of the c

Town Hall, Beeston, Nottingham.

# URBAN DISTRICT COUNCIL OF

TENDERS FOR SUPPLIES.

TEDNERS are invited for the SUPPLY of GOODS and for EXECUTION of the UNDERMENTIONED ITEMS of WORK during the year ending 31st March, 1963:—

MS of WORK during the year ending 71st Maria.

(1) Tarred and Bituminous Macadam and Fine Cold Asphalt.

(2) Gravel, Sand, Dry Broken Stone or Slap, Hardcore, Ashes or Slag Dust.

(3) Precast Concrete Kerbing, Edging, Paving Flags, etc.

(4) Cement Mixed Concrete.

(5) Cold Bituminous Emulsion.

(7) Dustbins.

(8) Protective Clothing and Rubber Boots.

(9) Motor Tyres and Tubes.

(10) Petrol and Fuel Oils.

(11) Coal and Coke.

(12) Srushes.

(13) Lead and Lead-based Paint.

Brushes.

(13) Lead and Lead-based Paint.

(14) W.C. Pans and Seats.

(15) Ball Valves.

(16) Spell Valves.

(16) Spell valves.

(17) Specifications and Forms of Tender can be obtained on application to the undersigned, to whom sealed Tenders, in the envelopes provided, must be forwarded so as to be received not later than 30th JANUARY, 1962.

The Council does not bind itself to accept the lowest or any Tender. G. B. BLACKALL, Clerk of the Council.

Council Offices. Corby, Northants. 14th December, 1961.

# CONTRACTS

AYLESBURY. MINISTRY OF TRANSPORT.

St. Christoper House, Southwark Street,
London, S.E.1.

PORT TALBOT BY-PASS-DEMOLITION OF

The MINISTER OF TRANSPORT invites TENDERS om contractors experienced in building demolition ork, for the FOLLOWING WORKS, to be comprised one Contract:

Demolition of Buildings, mainly demolition of Buildings, mainly demolition of Buildings.

work, for the FOLLOWING WORKS, to be comprised in one Contract:

Demolition of pullidings, mainly dwelling house, specials, Litywelyn Street, Upper Caradog Flace, King, Street, Brist, Street, Brist, View, Dan-y-Bryn and Dyffry Mondon, Contract documents and Drawings are available for inspection by appointment at the Offices of the Consulting Engineers, SIR OWEN WILLIAMS AND PARTNERS, 101-108 Tottenham Court Road, London, DARTNERS, 101-108 Tottenham Court Road, London, Devials, Briston, Court, Card, London, Court, Card, Card,

if a bona-fide Tender is submitted if a bona-fide Tender is submitting Tenders, which must be instructions for submitting Tenders, which must be received by Noon on FRIDAY, 12th January, 1962, are given in the Contract documents.

The Minister does not bind himself to accept the lowest or any Tender.

DIDING OF YORKSHIRE

RIDING OF YORKSHIRE COUNTY COUNCIL. NORTH

TENDERS are invited for the ERECTION of a NEW POLICE STATION. COURT HOUSE and WEIGHTS AND MEASURES OFFICE at PICKERING.
Applications for Bills of Quantities and Tender occuments to be made to the County Architect, County Hall, Northallerton.
COUNTY COUNCIL County Hall, Northallerton, by 2nd February, 1962.

BOROUGH OF GRAVESEND.

TENDERS, returnable by the 15th JANUARY, are invited for the SUPPLY of Two Fordson Scwt. VANS, taking one vehicle in part exchange. Specification and Tender Form available from BOROUGH ENGINEER AND SURVEYOR. 6 Woodville Terrace, Gravesend.

BOROUGH OF HOT ROLLED ASPHALT SURFACING.

N. C. SCRAGG. Town Clerk.

Town Clerk's
West Terrace,
Folkestone,
Folkestone,
15th December, 1961.
URB

WILLENHALL URBAN DISTRICT

SECOND ADVERTISEMENT.

WILLENHALL LAWN CEMETERY (FORMERLY NAMED BENTLEY LANE CEMETERY).

SITE PREPARATION WORKS.

TENDERS are invited on a Fixed-price Basis for the SITE PREPARATION WORKS and DEVELOPMENT of the ABOVE PROPOSED CEMETERY. Involving Earthmoving, Levelling, Drainage, Roads, Paths, Fencing and Seeding.

Tender documents may be obtained from the Office of the Engineer and Surveyor, and Drawings inspected at that Office during normal working hours.

Completed Tenders should be received by the Completed Tenders should be received by the ABOVE Completed Tenders and Tenders a

JOHN R. RIDING. Clerk of the Council. Town Hall, Willenhall, Staffs

HEREFORDSHIRE WATER BOARD.

BROMYARD DISTRICT WATER SUPPLY. CONTRACT NO. 24.

CONTRACT NO. 24.

The Herefordshire Water Board invite FIXED-PRICE TENDERS (In accordance with the Ministry of Housiand Local Government Circular No. 31/57) from competent Civil Engineering contractors having experience in similar work, for LAYING approx. 4,000% of 10in. do 3in. doi: 10.00% of 10in. do 3in. doi: 10.00% of ASSERS, CEMENT PIPE 10in. to 3in. doi: 7,500% of ASSERS, CEMENT PIPE 10in. doi: 10.00% of ASSERS, CEMENT PIPE 10in. doi: 10in

Reay House, 49 Bodenham Road, Hereford.

ADMINISTRATIVE COUNTY OF

ADMINISTRATIVE COUNTY OF LEICESTER.

The HIGHWAYS COMMITTEE of the LEICESTER COUNTY COUNCIL invites TENDERS for the year county to the March 1963, for the FOLLOWING:—

""" Tarmacadam.

"" Ta

Grey Friars.

# COUNTY COUNCIL OF WEST RIDING OF YORKSHIRE.

TENDERS are invited for GENERAL BUILDERS WORK in connection with the Proposed Improvements at the HIGHWAY'S DEPOT, SELBY ROAD, Garforth, near Leeds. Plans and Specifications are available for inspection at the Office of the Divisional Architect, Bishopparth, Applications to tender must be addressed to the Divisional Architect, Bishopsgarth, Westfield Road, Washefield.

Applications to tender must be addressed to the invisional Architect. Bishopsgarth, Westheld Road, Waterbell enders must be addressed to me, the under-signed, and received at Room 87, County Hall, Waterbeld, not later than 12 Noon on MONDAY, 28th January, 1962.

BERNARD KENYON, Clerk of the County Council.

# COUNTY BOROUGH OF WARRINGTON. UNIFORM CLOTHING 1962/63.

TENDERS are invited for the SUPPLY of UNIFORM and PROTECTIVE CLOTHING to the POLICE, TRANSPORT, FIRE SERVICES and other Departments of the Corporation for the year commencing 1st April, 1962.

Testurer, Sankey Street, Warrington, Tenders for Clothing," should be sent to the Chairman, Uniform Sub-Committee, Town Hall, Warrington, not later than 12 o'clock Noon on MONDAY, 15th January, 1962. The Corporation do not bind themselves to accept the lowest or any Tender.

S. KENNETH CROOK, Borough Treasurer's Office,

igh Treasurer's Office,

# Borough Treasurer Warrington. 15th December, 1961 METROPOLITAN BOROUGH OF

TENDERS are invited for the SUPPLY and DELIVERY One Bedford 10/12cwt. VAN.
Offers are invited for taking used Ford Van in the sychological statement of the Office are investigated from of Tender obtainable from Pricialization of Tender obtainable from Hall, after S.E.G. ENGINEER, Lewisham Town Hall, after S.E.G. Closing date, 10 a.m., 9th JANUARY, 1962.

BOROUGH OF NEATH.

# BOROUGH OF

PROPOSED REGRADING OF CIMLA COMMON AND ADJACENT ROADWORKS.

ADJACENT ROADWORKS.

TENDERS are invited for the REGRADING of CIMLA COMMON, area approx. 8½ acres, and adjacent Roadworks, sinclude the Drainage, Cultivation and Reseeding of the area. Roadworks include the Formation of a new Access Road and Adjustment and Reseeding of the area. Roadworks include the Granting of a certain grads.

Drawings and conditional contract may be inspected at and Specifications and Fourier Tender obtained on or after 18th December, 1961, from, the Office of the Borough Engineer, Gwyn Hall, Neath, upon ayment of a deposit of £2 2s. which will be refunded upon receipt of a bona-fide Tender.

Tenders, endorsed "Tender—Cimla Common," to be delivered in plain scaled envelope to the undersigned not later than 12 Noon on SATURDAY, 6th January, 1862.

not later than 12 Noon on SALVANANA (Inc. 1) of the Council does not bind itself to accept the lowest or any Tender.

D. KING DAVIES, Town Clerk. D. KING DAVIES, Town Clerk.

# WOKING URBAN DISTRICT COUNCIL. WYCH MILL BRIDGE—REGRADING AND RESURFACING.

TENDERS invited for above Contract. Work includes the FOLLOWING:
Approx 1,550 sq. yd. Asphalt Carpet to Carriage-Approx 2,200 tons Bitumen Macadam Regulating Course.
Approx. 650 sq. yd. Footways: together with 18in. Brick Retaining Walls, and Ancillary Tender occuments from Engineer and Surveyor on recept of Course and Surveyor on recept of bona-fide Tender not subsequently withdrawn. Flans seen normal office hours at Engineer's Office. Tenders delivered to CLERK OF THE COUNCIL by 453 a.m., THURSDAY, 11th January, 1962. It is anticipated that contractors will be required to commence work by 1st February, 1962.

#### CONTRACTS

# ISLE OF ELY COUNTY COUNCIL. NEW GRAMMAR SCHOOL-MARCH.

FIRM-PRICE TENDERS are invited from building contractors for the ERECTION of a NEW GRAMMAR SCHOOL on a site digining EASTWOOD HOUSE. WIMBLINGTON ROAD Marge EASTWOOD HOUSE. WIMBLINGTON ROAD Marge Tenders of the state of the sta

The construction receipt of Tenders will be available in mid-January. Tender documents will be available in mid-January. 1962.

The last date for receipt of Tenders will be WEDNESDAY, 14th February, 1962.

Contractors wishing to tender should submit their names by not later than 5th JANUARY, 1962, to the County Architect, County Hall, March, Cambs., together with a cheque for £5 Ss. payable to the Isle of Ely County Council, which will be refunded on receipt of a bona-fide Tender.

R. F. G. THURLOW,

Clerk of the County Council.

# COUNTY BOROUGH OF SUNDERLAND.

TENDERS are invited for SITE PREPARATION WORKS comprising approx. 1,460 sq. vd. of 8in. R.C. Carriageway and ancillary Drainage Works. Tender documents obtainable from Borough Engineer. 27 Fawcett Street, Sunderland, on payment of \$2.2 s., refundable on receipt of a bona-fide Tender, Cheques payable to "Sunderland Corporation." Sealed Tenders, endorsed "Tender for Site Preparation Works—East Cross Street Redevelopment Area." must be received by me not later than 18th JANUARY, 1962. G. S. McINTIRE, Town Clerk.

# COUNTY BOROUGH OF CROYDON. WINDOW CLEANING.

TENDERS are invited for CLEANING WINDOWS to the COMMUNAL PARTS of BLOCKS OF FLATS (Hallways, Landings, Entrance Doors, etc.) for 12 months commencing 1st April, 1962.

Particulars from the Housing Manager, 71 Park Lane, Croydon.

oydon. date for Tenders: 15th JANUARY, 1962. E. TABERNER, Town Clerk. BOROUGH OF BRIGHOUSE.

# MAIN DRAINAGE RECONSTRUCTION SCHEME. CONTRACT 18.

COMBINED SEWER—BRADFORD ROAD AND SMITHY CARR LANE, BRIGHOUSE.

TENDERS are invited for the LAYING of approx. 204 lin. yd. of 33in. and 151 lin. yd. of 21in. dia. CORNELIUS JOINTED SPUN CONCRETE PIPE SEWER. together with 8 Brick Manholes, and other ancillary works.

CORNELIUS Journal Control of the Manholes, and John Logether with 8 Brick Manholes, and John Conditions of Tender and other documents may be Conditions of Tender and other documents may be obtained from, and Drawings inspected at, the Office of the Borough Engineer, Commercial Street, Brighouse, on payment of One Pound deposit which is returnable on a bona-hde Tender.

Tenders must be received the undersigned not later than the 18th JANUARY 1962.

JOHN R. LIDDLE,
Town Clerk.

# Town Hall, Brighouse, 13th December, 1961. HUCKNALL URBAN DISTRICT COUNCIL.

NOTTINGHAM ROAD IMPROVEMENT.

TENDERS are invited for the REKERBING and RESURFACING of FOOTPATHS on NOTTINGHAM ROAD (A.611).

The works consist of approx. 1,200 lin. yd. of Kerbing, 3,400 super, yd. of Tarmacadam Surfacing to Footpaths, together with ancillary Drainage and other works.

to Footpaths, together with ancillary Drainage and other works.

The Conditions of Contract, Specification, Bills of Quantities, etc., may be obtained from the Engineer and Surveyor, Council Offices, Watnail Road, Hucknail, Nottingham, on payment of \$2 2s. deposit which will be returned on receipt of a bona-fide Tender and Tenders, in plain sealed envelopes, which will be supplied, suitably endorsed, must be received by the undersigned not later than 5 p.m. on MONDAY, the 22nd January, 1962.

The Council does not bind itself to accept the lowest of any Tender.

H. SHARP,

H. SHARP, Clerk of the Council. Council Offices, Hucknall, Notts. 15th December, 1961.

# HUCKNALL URBAN DISTRICT COUNCIL. WELBECK ESTATE-FOOTPATHS.

WELBECK ESTATE—FOOTPATHS.

TENDERS are invited for the SURFACING of FOOTPATHS and the SEEDING of VERGES on the WELBECK HOUSING ESTATE.

The works consist of Excavating approx. 1,100 cu, yd. of Soil, Providing 1,975 lin. yd. approx. of Tarmacadam Footpaths, and Preparing and Seeding approx. 1,975 lin. yd. of Verges, together with other ancillary work.

Of Quantities, etc., may be obtained from the Engineer and Surveyor, Council Offices, Watnail Road, Hucknail, Nottingham, on payment of £2 2s. deposit which will be returned on receipt of a bona-fide Tender and the return of the documents.

Tenders, in plain sealed envelopes, which will be supplied, suitably endorsed, must be received by the undersigned not later than 5 p.m. ca MONDAY, the 12th February, 1962.

The Council Tose not bind itself to accept the lowest or any fender.

H. SHARP,

Clerk of the Council.

H. SHARP, Clerk of the Council. Council Offices, Hucknall, Notts. 15th December, 1961

# STOCKPORT CORPORATION.

TWO-STOREY BLOCK of 27 AGED PERSONS' FLATLETS, including Warden's Flat and Communal Accommodation, and 10 AGED PERSONS' BUNGA-LOWS. Selected list of contractors will be invited to TENDER.

NDER.
Apply for inclusion to BOROUGH ARCHITECT, wn Hall, Stockport, by 4th JANUARY, 1962.
Documents available on that day.
Tenders due 12 Noon, 5th FEBRUARY, 1962.

#### CONTRACTS

SUPPLEMENT

# THE URBAN DISTRICT COUNCIL OF

CONSTRUCTION OF WAITING BAYS-NORMANBY ROAD, NORMANBY.

TENDERS are invited for CARRYING OUT the ABOVE WORKS, comprising the Construction of approx. 370 sq. yd. of Reinforced Concrete Walting Bays, together with ancillary works.

Copies of the Specification, Bill of Quantities and Form of Tender may be obtained from the Engineer and Surveyor, Town Hall, Fabian Road, South Bank, will be considered to the Company of the Construction of the

documents before the closing date for the recent documents before the closing date for the recent documents before the closing date for the recent of Tenders. The General Conditions of Contract and Drawings may be inspected at the Office of the Engineer and Surveyor during normal working hours.

Tenders, in plain sealed envelopes endorsed the contract of the contr

Town Hall,
Fabian Road,
South Bank,
Middlesbrough,
15th December, 1961.

URBA

STOWMARKET URBAN DISTRICT

CONSTRUCTION OF SIX PAIRS OF BUNGALOWS.

CONSTRUCTION OF SIX PAIRS OF BUNGALOWS.

TENDERS are invited for EITHER or BOTH of the UNDERMENTIONED CONTRACTS:

(a) Two pairs of South-aspect Bungalows at Webb Road.

(b) Webb Road.

(b) Webb Road.

(c) South-aspect and two pairs of North-aspect Bungalows at Recreation Rnaff and Pages Close.

Both Contracts include Erection of the Bungalows, together with Work in Foundations, Siteworks, Drainage, Paths, Fencing, and other ancillary works.

Drawings may be inspected, and Tender documents obtained from the Office of the Engineer and Surveyor.

Drawings may be inspected, and Tender documents obtained from the Office of the Engineer and Surveyor.

Strainary, 1982, on payment of a denote the Tender not subsequently withdrawn, and the return of all documents.

Tenders to be delivered to the undersigned not later than Noon on WEDNESDAY, the 24th January, 1962, in the envelope provided, endorsed "Housing Contraction of the Council does not bind itself to accept the lowest or any Tender.

R. A. BAILEY.

R. A. BAILEY, Clerk to the Council. Council Offices, Ipswich Road, Stowmarket, Suffolk.

# CHICHESTER RURAL DISTRICT

# LIST OF APPROVED TENDERERS FOR PUBLIC WORKS SCHEMES.

The Council invite contractors with at least five years' experience in the execution of contracts for public works, including sewerage and sewage disposal, to apply for their names to be placed upon the List of Approved Tenderers to be prepared by the Council, and from whom public works Tenders will in future be invited. The List, which will be reversely time to time, will be split to the contract of the Council of the Cou

and contractors applying will be required to complete a Questionnaire, which may be obtained from the Engineer and Surveyor, J. K. LAWSON, F.R.I.C.S., East Pallant House, Chichester, and which is to be returned to him not later than 20th JANUARY, 1962.

G. T. GILES, Clerk of the Council.

Pallant House, Chichester, December, 1961. SUB-CONTRACTORS (ALL TRADES) WANTED for HOUSING CONTRACT in Selsey, Sussex.—Apply, in writing, to McMANUS LAYTON, LTD., 8 Boydeli Court, St. John's Wood Park, N.W.8.

J. C A R R, Technical Estimating Services, 73 Leadenhall Street, London, E.C.3. Telephone: AVE. 9676-1120.

For Contracts received too late for classification see page 993

# APPOINTMENTS VACANT

# POPLAR BOROUGH COUNCIL.

BUILDING SUPERINTENDENT REQUIRED IN Building Maintenance (Works) Section. Commencing salary within Grades A.P.T. II (£855-£1,000 p.a. including Weighting). according to experience and qualifications.
42-hour week (5 days Summer: 5¹2 days Winter). Superannuation.
Apply immediately to BOROUGH ENGINEER AND SURVEYOR, Poplar Town Hall, Bow Road, E.3.

BOROUGH OF OLDBURY.

# APPOINTMENT OF CHIEF ENGINEERING

APPLICATIONS are invited for this APPOINTMENT within Grade A.P.T. V of the National Salary Scales (£1,310-£1,480 p.a.), according to qualifications and superiors.

experience.

Applications must be Corporate Members of the Institution institution of Civil Engineers and/or the Institution of Municipal Engineers, and must have had good experience in general municipal engineering work. Forms of Application and further particulars may be obtained from the undersigned, to whom application should be delivered by MONDAY, the 8th Jan. 1962.

Mousing accommodation may be made available to tions another took and the successful applicant, if married.

Housing accommodation may be made available to the successful applicant, if married.

KENNETH PEARCE, Town Clerk.

Municipal Buildings, Oldbury, Near Birmingham, December, 1961.

# APPOINTMENTS VACANT

SUPPLEMENT

# TANGANYIKA.

WATER DEVELOPMENT AND IRRIGATION DIVISION.

#### SENIOR HYDROLOGIST.

SENIOR HYDROLOGIST.

Duties: Under the Chief Planning Engineer, to take control of a large hydrological section and staff, and be responsible for all hydrological section and staff, and be responsible for all hydrological investigations and works in the territory of the control of the contr

per child.

Apoly DIRECTOR OF RECRUITMENT. Department
of Technical Co-operation. Cariton House Terrace,
London, S.W.1, quoting D14/RC328/145/03, and
giving full name, age, and brief details of qualifications
and experience.

# TANGANYIKA.

# MINISTRY OF AGRICULTURE.

# WATER DEVELOPMENT AND IRRIGATION

#### CHIEF PLANNING ENGINEER.

Duties: To be responsible for the administration and staff of the Central Design and Research Branch. Duties will include the study of water resources of river basins, in connection with irrigation, hydropower, flood protection, etc. He will also have to initiate surveys investigation, prepare designs and specifications, and submit technical reports on proposals, including forecasts of expenditure, and financial Obtalifications: Candidates must be A MIJCE.

posals, including forecasts of expenditure, and financial reports.

Qualifications: Candidates must be A.M.I.C.E., with at least 15 years' civil engineering experience connected with Irrigation, hydro-electric power, flood protection and drainage schemes. Previous experience in hydraulic research work, including indoor and outdoor models, is desirable.

21-27 months.

Emoluments (including gratuity): £3.593 p.a.
Free passages. Free medical attention. Generous home leave, and education allowances up to £200 p.a. per child.

Apply DIRECTOR OF RECRUITMENT, Department of Technical Co-operation, Cariton House Terrace, London, S.W.1, quoting D14/RC328/145/04, and giving full name, age, and brief details of qualifications experience.

# CENTRAL ELECTRICITY GENERATING

#### MIDLANDS PROJECT GROUP.

# FOURTH ASSISTANT ENGINEER (CIVIL)-

APPLICATIONS are invited for the APPOINTMENT
of FOURTH ASSISTANT ENGINEER (CIVIL)—
QUANTITIES in the Midlands Project Group at
RourneyIII

Bourneville.

Applicants should be competent Quantity Surveyors with experience in estimating, billing and measurement for power stations or other large industrial buildings and ancillary works—particular experience in site measurement would be an advantage.

Applicants should preferably hold an appropriate qualification.

The salety for the appointment will be within

The salary for the appointment will be within Scale 10 (£1,070-£1-325 p.a.) of the National Joint Board Agreement.

Scale 10 (\$1.070-\$1-320 pt.a.) of the Board Agreement.

Applications should be made on Standard Form AE.6, available from the ADMINISTRATIVE OFFICER. Midlands Project Group, P.O. Box 314, Birmingham, 30, and should be returned to him not later than 8th JANUARY, 1962.

Envelopes should be marked "Confidential," quoting Staff Vacancy No. MPG.75/61.

COUNTY BOROUGH OF GRIMBSY.

# BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT.

# SENIOR ENGINEERING ASSISTANT.

SENIOR ENGINEERING ASSISTANT.

APPLICATIONS are invited for the APPOINTMENT of a SENIOR ENGINEERING ASSISTANT on the Permanent Staff. Grade A.P.T. V. commencing salary The appointment is subject to the Conditions of Service of the National Joint Council, terminable by sine month's notice on either side, and to the Provisions of the Local Government Superannuation Acts. The successful candidate will be required to pass a medical examination. Housing accommodation for a married person will be available to the council of the provision of the Local Government Superannuation and Edition of the Provision of the Local Government of the Provision of the Local Government of the provision of the Local Government and details of experience, together with the names and address of two referees, must be delivered to the undersigned not later than First Post on MONDAY, 8th January, 1962.

J. V. OLDFIELD, M.Inst.C.E., Borough Engineer and Surveyor.

# Municipal Offices, Town Hall Square, Grimsby, December, 1961. HERTFORD RURAL DISTRICT COUNCIL.

# TEWIN SEWERAGE.

TEWIN SEWERAGE.

The Hertford Rural District Council REQUIRE the services of a RESIDENT ENGINEER to supervise the construction of sewage pumping station and rising main and sewers, being part of a main contract at Tewin, near Hertford, the semantial revining the semantial re

Walifields, Pegs Lane, Hertford. 13th December, 1961.

#### APPOINTMENTS VACANT

#### COUNTY COUNCIL. PARK DEPARTMENT.

FOREMEN REQUIRED: In charge of laying-out works. To supervise landscape contracts. Experienced in grading, cultivating, draining, turning and planting. Up to 275.Forms from CHIEF OFFICER, Parks Department (A.1 (C) 3281 / 12a). County Hall, S.E.1 (WATerloo 5000—Ext. 8076).

# WARWICKSHIRE COUNTY COUNCIL. COUNTY SURVEYOR'S DEPARTMENT.

APPLICATIONS are invited for the POSITION of COST ACCOUNTANT to take charge of the accounting

APPLICATIONS are invited for the accounting section of the department. The duties will comprise Preparation of Estimates, returns to the Ministry of Transport, works costing, ordering plant and materials, dealing with wages the section.

A knowledge of machine accounting and experience in a Surveyor's Department will be an advantage. The appointment will be Grade "B." salary £1,545, rising by two annual increments of £65 and £60 to £1,670 p.a., and subject to the Local Government examination. There is also a 5-day week in operation. Consideration will also be given to the granting of financial assistance towards removal expenses. Applications, stating previous experience, and qualifications, together with copies of two testimonials, to be sent to the County Surveyor, Shire Hall,

# Shire Hali, Warwick. 5th December,

# COUNTY BOROUGH OF NEWPORT.

APPLICATIONS are invited for the APPOINTMENT of a CLERK OF WORKS in connection with a main darrange scheme involving the laying of large-diameter sewers, construction of pumping stations and rising

drainage scheme involving the laying of large-chameter sewers, construction of pumping stations and rising mains applicants should have had extensive experience in the supervision of such works, including piling and reinforced concrete structures. The post will be superannuable, and will be within the salary range of £960-£1,140 (Grade A.P.T. III). Approved furniture removal expenses will be paid. Applications, together with the names of two referees, should reach the BOROUGH ENGINEER, CIVIC Centre, Newport, Mon., by the 8th JANUARY, 1362.

# HAYES AND HARLINGTON

CIVIL ENGINEERING CLERK OF WORKS
(TEMPORARY) REQUIRED.
Salary within Miscellaneous Grade VI. 1.8 CIVIL ENGINEERING CLERK OF WORKS (TEMPORARY) REQUIRED. Salary within Miscellaneous Grade VI. i.e., 5760-5825 p.a. plus appropriate London Weighting, advancing to Grade A.P.T. II on 1st April, 1962, i.e., 5815-5960 p.a. plus London Weighting. Duties consist mainly small road improvement and sewerage schemes. Subject to salisfactory service, the person appointed will be transferred from job to job. A continuing programme of work is anticipated. Working hours related to those work anticipated. Working hours related to those work in the continuing accommodation available. Further particulars, Form of Application, etc., obtainable from the undersigned, which, when completed, must be returned by 1st JANUARY, 1962. GEORGE HOOPER, Town Hall.

# Town Hall, Hayes, Middx.

# SOUTHWICK URBAN DISTRICT COUNCIL.

APPLICATIONS are invited for the POSITION of GENERAL FOREMAN in charge of Highways, Sewerage, Cleansing and Lighting Section of the Engineer and Surveyor's Department. The salary will be within Misc. Division of N.J.C. Scales Grades IV and V (Grade IV £625, rising by £20 increments to £685; or Grade V £685, rising by £25 increments to £760), the commencing salary to the commencing salary to the salary to

in other respects subject to N.J.C. Commissions Service.

The Council will consider the provision of housing accommodation if necessary.

Applications, stating age, present and previous employers, training, experience, and giving the names of two persons from whom references may be obtained, are to be delivered to the undersigned not later than SATURDAY, 23rd December, 1961.

A. R. SHOTT.

Clerk of the Council.

# Town Hall. Southwick. Brighton, Sussex. 6th December, 1961. COVENTRY CORPORATION.

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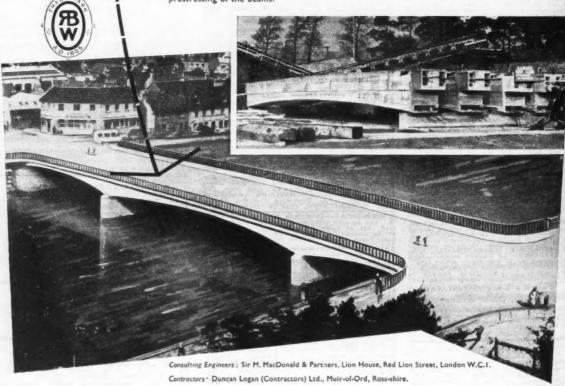
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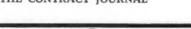
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COUNTY BOROUGH OF SOUTHAMPTON.

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The compression of the ABOYE ROAD. The works are all the control of the cisting and surfacing, Fencing and various ancillary structured and surfacing, Fencing and various ancillary and the compression of a reinforced concrete pedestrian subway. The compression of the compression of

C. J. MORTON. Town Clerk.

MANCHESTER. CITY OF

TENDERS Invited for ALTERATIONS to CROSSLEY STREET CANTEEN, Gorton. Bill of Quantities from the CITY ARCHITECT, P.O. 80x 488. Town Hall. Tenders returnable by 30th JANUARY, 1962.

Tenders returnable by 30th JANUARY, 1962.

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SITE ENGINEERS urgently REQUIRED for hydro-electric scheme in the West of Scotland. Excellent prospects.—Write, with full details of experience, etc., to 8ox V.5346. "The Contract Journal."

to Box V.3349. The Contract Journal."

QUANTITY SURVEYOR. experienced in industrial roding. REQUIRED. Driving experience essential. Write, giving full details of experience, salary anticipated, etc., to Box V.5348. "The Contract Journal."

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The documents will be available in JANUARY, 1962, and to be completed in NOVEMBER, 1962.

Applications, glving comprehensive details of premagnitude area of the comprehensive details of the comprehensive d

PRIVATE STREET WORKS.

MAKE-UP OF HOPE ROAD, HIGH VIEW RISE AND BROMFELDE ROAD, CRAYS HILL.

TENDERS invited for the WORKS, comprising Construction of 5-80 lin, yd, of 6in, 9in, 12in, and 15in, dia. Sewers, 2,770 sq. yd. Reinforced Concrete Carriageway, and 1,535 lin, yd. Cold Asphalt Footpaths, with ancillary works.

Engineer and Surveyor, from whom Tender documents may be obtained on payment of a deposit of the Guineas (refundable).

Tenders from the ENGINEER AND SURVEYOR, 88 Town Square, Basildon, Essex, returnable by Noon, 16th JAMUARY, 1982.

TRAINES SITE CLERKS to learn wages, timekeeping, cost records, etc., for road contracts in Greater London area. Experience not essential. Permanent and pensionable if satisfactory.—Write, stating age, previous experience, and salary required, to FITZPATRICK AND SON (CONTRACTORS), LTD., CVII Engineering Contractors, 455 Old Ford Road, London, E.3.

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GENERAL FOREMAN REQUIRED for reinforced concrete construction works in Midlands. Good salary and allowances. Housing could be made available.—Write details of experience, and when free, to Box V.5340, "The Contract Journal."

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ENGINEER AND SURVEYOR'S DEPARTMENT. ENGINEERING ASSISTANT.

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Applicants should have had good general experience will be given to those having suitable qualifications. In municipal engineering and surveying, and preference will be given to those having suitable qualifications. Siving age, full details of experience and pilications, giving age, full details of experience and pilications, giving age, full developed to the tenton that the first Post cent the undersigned not later than the First Post on FRIDAY, the 12th January, Consideration will be given to the provision of housing accommodation.

J. OWEN HUNT. Clerk of the Council.

Town Hall, Matlock, Derbys. 13th December, 1961.

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The Council invite APPLICATIONS from persons of exceptional experience for the APPOINTMENT of exceptional experience for the APPOINTMENT of exceptional experience for the APPOINTMENT of the Construction of the Given AND of the Engineers, MESSRS, WILLCOX, RAIKES AND of the APPOINTMENT of the Construction of the above scheme.

The value of the work is approx. £110,000, and the anticipated period of the contract for the work, which governs the length of the appointment subject to satisfactory service, will be 15 months. The appointment will be determinable on two months' notice given by either side.

Applications, giving full details of experience, age, when disengaged, salary required, with references or when disengaged, salary required, with references or copies of recent testimonals, should be sent to the undersigned not later than MONDAY, 29th January, 1962.

(Signed) D. W. NEWPORT, Clerk of the Council.

Council Offices.

11 Guild Street,
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19th December, 1961.

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INCORPORATING

THE BRITISH CONSTRUCTIONAL ENGINEER AND THE CONTRACTOR

### THE CONTRACT JOURNAL

incorporating
THE BRITISH CONSTRUCTIONAL ENGINEER
and
THE CONTRACTOR

No. 4,304 Vol. CLXXXIV Dec. 21, 1961

Editor: LAWRENCE McCARTHY

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### Advertisements

Advertisement rates may be obtained on application to R. Binfield, Advertisement Manager,

# PLANNING FOR CONSTRUCTION

BETWEEN the wars there were violent fluctuations in investment. It was these fluctuations that were largely responsible for the seven year trade cycle of boom and depression. Things have changed since 1945. Government money (including the expenditure of the nationalised industries) now plays a much bigger part in investment. The total volume of investment has grown and has become much more stable so that the boom and bust trade fluctuations have been greatly attenuated. Instead the national economy has oscillated relatively narrowly around a 2 per cent. unemployment line the cycle being four years and not seven.

Thus today's problem is to reconcile full employment with inflation. Inasmuch as the problem has not been solved, the result has been a stop-go economy. The proposed National Economic Development Council is now the main hope of finding the solution. And although the courtship of the T.U.C. to join the council has been fumbled and bungled there is still an even chance of an ultimate consent.

Similar fumblings seem to have accompanied the proposed formation of the planning council for the construction industry. It would be a great pity if this imaginative scheme were to be frustrated by internal bickerings. For the construction industry, which is undergoing a period of rapid change, stands to gain more than most other industries from the fruits of planning. There is still in some quarters the idea that public works can be switched on and off like a tap. The proposed construction industry planning council could not be a better instrument to kill this unemployment relief mentality stone dead. And while the violence of the fluctuations in investment have been greatly attenuated the fact remains that the dismal repetition of capital cuts and investment restrictions over the past fifteen years have dealt heavy blows at confidence. Yet confidence is vital if contractors are to tackle the problems of apprenticeship, management training and mechanisation, and if the material producers are to lay down sufficient productive capacity.

The statistics of construction output show a slowish upward trend sullied with stagnation in 1950, 1955 and 1957/8 and enlivened with a leap forward in the past three years. But the input statistics, in so far as they exist, show substantial fluctuations both in total and among the various classes of work. Nor do these figures reveal the whole story. For the construction industry has not only suffered from cuts in actual programmes such as opencast coal. It has also suffered from the slow emergence of projected programmes such as roads which were talked about for years before they materialised.

Statistics are a vital tool of planning. Construction statistics are sparce and scattered. More and better statistics will be required if the planning exercise is to be effective. Obviously this exercise will be concerned with the future. Forecasts will have to be made of the demands on construction that lie ahead so that all sectors can gear themselves up to meet these demands. Short term fluctuations will doubtless still occur although it would be hoped on a reduced scale. But if the industry could be assured that such fluctuations were but a temporary setback in a good long term future a major objective would be achieved. There is, however, a danger that must be faced in an industry as big and as scattered as construction. This is that when the best forecasts have been made and announced the projected programme might be over subscribed by the industry. Such an eventuality would be just as disastrous as a capital cut.

# SPINNING FORTH ROAD BRIDGE CABLES

# First Operation of its Kind in Europe

THE most difficult and outstanding phase of the construction of the Forth Road Bridge—the spinning of the main cables across the river—has been reached. On November 17, the first four wires of the cables of the new bridge were hauled over the tops of the 512ft. high towers, and the fourmonth spinning operation is now under way. With men working under arduous conditions for two eight-hour shifts from 8 a.m. to midnight, more than 300 miles of wire is being spun in place each day of a six-day week.

each day of a six-day week.

The cables are each made of 11,618 parallel wires of galvanised high tensile steel, and when completed they will be about 22½in. diameter.

At the anchorages the wires are divided into 37 groups known as strands, each group being looped around a strand shoe which connects it to the anchorage.

Experience has shown that the most practical thickness of wire is about 0.19in.—with an ultimate strength of about 100 tons per square inch. By drawing the wire thinner the ultimate tensile strength could be increased, but a greater length of wire would then have to be spun. Moreover, if the wires were made thicker their ultimate strength would be less and they would become too stiff to bend round the pulleys and reels. pulleys and reels.

#### First in Europe

Cables of parallel wire made in this way were invented many years ago by John A. Roebling, and used by him in the famous Brooklyn Bridge (1883) in New York. This system has become the standard practice on bridges of great span in the U.S.A., but until the construction of the Forth Road Bridge it had never been used in Europe. For this reason, the contractors sought advice from Messrs. Roebling of Trenton, U.S.A., who gave most valuable assistance in the design of the cable spinning equipment and the organisation to be set up at site.

#### Reeling Shop

In the Forth Road Bridge some 30,000 miles of wire will be needed—sufficient to stretch about 11 times around the world. The whole 6,350 tons of wire has now been made by Dorman Long (Steel), Ltd.; 1,500 tons has been delivered to site in 10cwt. coils and the balance is stored under cover

in Middlesbrough in big polythene bags. In the reeling shop at the south end of the bridge site the coils of wire are loaded on to swifts by the pillar cranes and reeled through tensioning devices on to big drums, 90 of which are available, each capable of taking 7 tons of wire. The individual coils are spliced together by means of cylindrical nipples, into which

erected across the river from the anchorerected across the river from the anchorages and over the tops of the towers, about 4ft. below the level at which the main cable would ultimately be. Each footbridge is 9ft. wide and supported by 10 strands Iin. thick—eight of which carry the wire mesh floor of the catwalk, whilst the other two support the wire mesh parapets.



Steel erectors adjusting wires during spinning

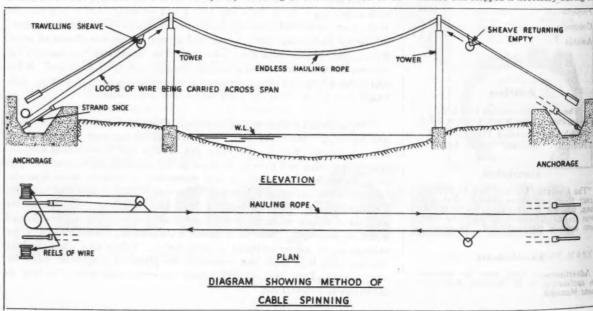
the ends of the wire are inserted and then squeezed in a 200-ton press.

The loaded drums of wire are then mounted in turn on eight unreeling machines set up behind the south anchorage. These machines deliver the wires through a counterweight tower designed to ensure equal tension in all of them, and so to the spinning wheels that carry them over the span.

Before the spinning could start, temporary footbridges or catwalks had to be

These 20 footbridge strands, which are about 6,000ft. long, were erected by unreeling them one at a time from a drum on a pontoon which was towed across the river. Two strands, one upstream and one downstream, were erected per tide. The timing of this work had to be agreed by the Admiralty and the Forth Conservancy.

The strands were laid over the main piers and the ends connected to the tops of the side towers. Shipping then had to be warned and stopped if necessary during the



lifting of each strand from the bed of the river, which was done at low water.

It was found possible to lift the strands in fast running tides and winds up to 30 m.p.h. The strands brought up with them old coils of wire and anchors from the bed of the river, which had to be removed by the site launch.

When all the footbridge strands had been erected and adjusted to the correct sag, the panels of wire mesh for the flooring and parapets were assembled on them, and they were interconnected by seven tubular crossbridges and tied down by

Each wheel has four grooves on it, so that it can carry four bights or loops of wire and haul them across the span.

and haul them across the span.

When the spinning starts four wires, taken from the unreeling machines through the counterweight tower, are temporarily connected to the strand shoe at the anchorage and the loops of wire passed round the spinning wheel. The final wires of the last trip of the strand will later be spliced to these ends.

The tramway drive is then set in motion at the same speed as the unreeling machines and the four bights of wire are

intervals of about 400ft. along the full length of the catwalks, and it is their duty to adjust the wires as they are laid against a fixed guide wire—thus ensuring that they all have the same sag in the main span and side spans. Emergency stop buttons are provided for these men so that they can stop the wheel immediately in case of necessity.

The spinning wheel travels fast, reaching a speed of 700ft. per minute, which enables four bights (eight wires) to be placed every 18 minutes.

Lights are installed throughout the length of the catwalks, and make a fine sight, festooned across the river by night. In addition, telephone lines are laid along the walks and electric control signals and "come-alongs" assembled for use in adjustment of the wises. ment of the wires.



After every strand consisting of an average number of 314 wires has been spun, it has to be shaken out for its full length for inspection and then banded up again at intervals. The strand is finally adjusted at night, when the temperature is constant all over the bridge, to ensure that it has exactly the right sag in the main span and side spans.

that it has exactly the right sag in the main span and side spans.

During the cable spinning some 50 or 60 men, scattered over 6,000ft. of exposed footbridge, up to 500ft. in the air, must all work in concerted intelligent action day and night, in good weather and bad, for eight-hour shifts without a break in order to get good production. In addition, other gangs are needed at the tower tops and anchorages to load and unload the spinning wheel and operate the adjusting equipment. The despatcher is the key man who controls the spinning from his office at the south anchorage.

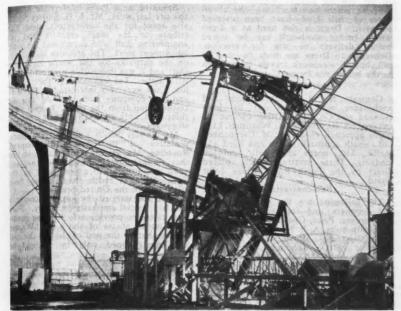
Compaction of Wires



When the whole cable has been erected and the wires adjusted, they are compacted and the wires adjusted, they are compacted by squeezing them tightly together so as to form a compact circular section. This is done by four machines that encircle the cables and are moved along them squeezing the wires hard together at intervals of 3ft. by means of hydraulic jacks. After completion each cable is permanently clamped in position in a machined cast steel saddle on the top of the towers.

Cable bands of cast steel are then bolted at each panel point along the cables, and over these are placed long wire rope suspenders which hang down and carry the deck of the bridge.

The last operation on the cables—which



View of anchorage, showing connecting wires, catwalk and spinning wheel

storm guys to prevent any risk of their being blown over.

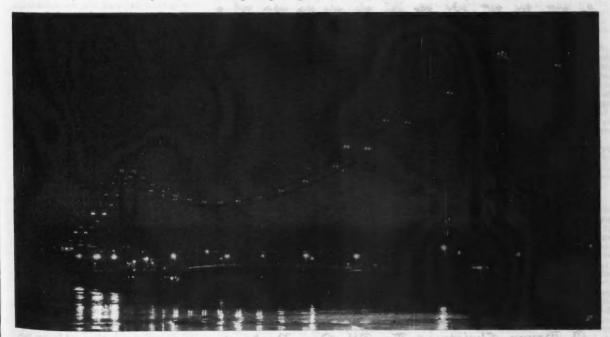
being blown over.

The next job was the assembly of the "tramways", the reversible hauling ropes which carry the spinning wheels and are supported by a series of beams about 20ft. above the footbridges. Each hauling rope or tramway carries two 4ft. diameter spinning wheels, one at the north and the other at the south end, and is electrically driven.

the one one by

carried over the tops of the towers to the far anchorage, where they are taken off the wheel by hand and placed around the strand shoe at that end. When the tramway drive is again set in motion the wheel at the north end will return empty, but the other spinning wheel with four more loops of wire on it will be on its way from the south to the north side.

During the spinning men are stationed at



Lights installed throughout length of the catwalks

cannot be done until most of the deck has been erected—is that of painting and wrap-ping them around with binding wire throughout their length between the cable bands. This is performed by means of bands. This is performed by means of automatic wrapping machines which en-circle the cables and travel up them wind-ing on the wrapping wire as they proceed.

# Safety Measures

Safety is considered of prime importance and to this end the temporary footbridges are provided with wooden slats on the flooring and wire mesh parapets 3ft. 6in. high; safety belts are available for any man who needs one, and the wearing of safety helmets is compulsory for everybody.

It is interesting to note that bridge con-struction is so mechanised today that, whereas 4,500 men were engaged on the old Forth Railway Bridge, the greatest number at any time on the Forth Road Bridge will not exceed 250.

#### World's Fourth Longest

World's Fourth Longest

The Forth Road Bridge—the greatest single span in Europe—and the fourth longest in the world—is being built near to the world famous railway bridge which was completed 70 years ago. It will have a main span of 3,300ft. and two side spans of 1,340ft, each, the length between the abutments of the approach viaducts being 1½ miles. Some 30,000 tons of steelwork will be used on the bridge, together with 150,000 cu, yd. of concrete.

Preparations at site for the building of the superstructure started at the beginning of 1960. Designed by Mott, Hay and Anderson, and Freeman, Fox and Partners for the Forth Road Bridge Joint Board, the

for the Forth Road Bridge Joint Board, the bridge will be the longest span built in Great Britain since the Forth Railway

Bridge was opened.

The contract for the superstructure, amounting to about £9,000,000, was awarded to The A. C. D. Bridge Company, a partnership formed by Sir William Arrol and Co., Ltd.; The Cleveland Bridge and Engineering Co., Ltd.; and Dorman Long (Bridge and Engineering), Ltd.

# Steelwork Tonnage

The approximate tonnages of steelwork in the bridge are: Towers, 6,000 tons of structural steel; cables, 8,000 tons of galvanised steel; and suspended structure, 16,000 tons of structural steel.

All the structural steelwork is being fabricated in the works of one or other of the partners or their subsidiaries. The

bulk of the steel in the towers and suspended structure is of high tensile quality to B.S.S. No. 968 and is shop welded. Site connections are made by means of high strength bolts in clearance holes which grip the plates by friction and are tightened using pneumatic wrenches. This is a quicker, cleaner, more economical process than riveting and more acceptable to modern labour.

The structural steelwork is all cleaned by grit blasting metallised with a coat of zinc and protected by four coats of paint. A considerable portion of this work is being carried out at Drem. East Lothian, in an existing hangar adopted for the purpose, where new machines—the prototypes of their kind—have been installed to do it. Drem is also used as a depot where bridge steelwork can be stored before delivery to site for erection. Deliveries to Drem are made by road or rail, but all steelwork travels from Drem to the bridge site by road. to the bridge site by road.

# Other Contractors

Contract No. 1 for foundations and anchorages was carried out by John Howard and Co., Ltd. Other contractors engaged on the project are: Whatlings, Ltd., north approach roads; A. M. Carmichael, Ltd., south approach roads; and Reed and Mallik, Ltd., north and south approach viaducts. These contracts were placed direct by the Forth Road Bridge Joint Board.

#### Sub-contractors

The following are the sub-contractors and suppliers, and approximate value of their orders: Paint, Griffiths Bros., and Co. (£20,000); bolts, A. P. Newall and Co., Ltd. (£70,000), and S. Marsdon and Son, Ltd. (£8,000); lifts, Keighley Lifts, Ltd. (£14,000); site buildings, H. Peel, Ltd. (£16,000); site buildings, H. Peel, Ltd. (£8,000), Fleming Bros., Ltd. (£3,000), and Clyde Structural Iron Co., Ltd. (£5,000); electrical work, J. Kirkpatrick and Sons, Ltd. (£12,000); air compressors, tools, etc., Consolidated Pneumatic Tool Co., Ltd. (£30,000); derrick cranes, J. M. Henderson and Co. (£100,000), and Butters Bros., Ltd. (£20,000); mobile cranes, N.C.K. Rapier Sales, Ltd. (£12,000); wire ropes and strands, Bruntons (Musselburgh), Ltd. (£200,000); The following are the sub-contractors Bruntons (Musselburgh), Ltd. (£200,000); zinc wire, Chas. Clifford, Ltd., £30,000; metallising plant and equipment, Metallisa-tion, Ltd. (£10,000); grit blasting plant and equipment, Spencer Halstead, Ltd. (£30,000); road transport, Gavin Wilkie,

Ltd., (£70,000); cable splicers, etc., Cable Covers, Ltd. (£4,000); trailers, Taskers of Andover (1932), Ltd. (£10,000); red lead paint, Federated Paints, Ltd. (£2,000); tempy, civil work, Gibson and Milne, Ltd. (£6,000); caylan and propage, Brista panti, Federated Tahts, Ltd. (£2,000); tempy, civil work, Gibson and Milne, Ltd. (£6,000); oxygen and propane, British Oxygen Co., Ltd. (£2,000); welding equipment. Murex Welding Processes, Ltd. (£8,000); motor vehicles, Rossleigh, Ltd. (£8,000); wire for cables, Dorman Long (Steel), Ltd. (£560,000); oils, etc., Shell Mex and B.P., Ltd. (£20,000); mobile crane, R. H. Neal (£8,000); site buildings, Chas. Brand, Ltd.

#### Tribute to Men

Speaking at a Press conference held at the site last week, Mr. J. H. Shirley Smith, site agent for the contractors, paid high tribute to the steel erectors and the engineering staff who supervised the night adjustment work. The erectors had to stay on the catwalks for the whole eight-hour shift and it was impossible to provide them with shelter. Tea was taken to them on the with shelter. Tea was taken to them on the job. They were very interested in the work and the company had received splendid co-operation from the men. In two years there had only been two small unofficial stoppages

Mr. Shirley Smith said that the representative of the American company, Roebling, Mr. Harold Hill, had told him that cable spinning in such weather and wind conditions as experienced in the Firth of the Forth had never been attempted in the United States.

From the start of the job, the company had laid special emphasis on safety. They were trying to provide safe working conditions on all stages of the job. "We are hoping that by the end of the job the cost will be reckoned only in money," he stated stated.

# SEVERN BRIDGE SUPERSTRUCTURE Contract Negotiations

The Contract Journal understands that egotiations are in progress between the linistry of Transport and Associated

The Contract Journal understands that negotiations are in progress between the Ministry of Transport and Associated Bridge Builders, Ltd., for the erection of the superstructure of the Severn Bridge, Associated Bridge Builders, Ltd., is a consortium comprising Sir William Arrol and Co., Ltd.; The Cleveland Bridge and Engineering Co., Ltd.; and Dorman Long (Bridge and Engineering), Ltd. These firms form the A.C.D. Bridge Co., partnership which is currently constructing the Forth Road Bridge.

John Howard and Co., Ltd., London, are at present at work on the substructure. (The Contract Journal, March 9 and 16.) The consulting engineers are Mott, Hay and Anderson in association with Freeman, Fox and Partners. Sir Percy Thomas is the consulting architect.

# INDIAN MINE CONTRACT FOR CEMENTATION

CEMENTATION

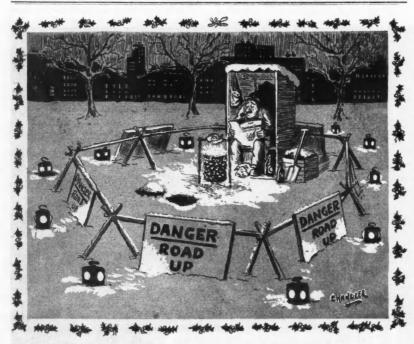
The Indian branch of The Cementation Co., Ltd., 20 Albert Embankment, London, S.E.1, have been awarded a contract by the Metal Corporation of India for a new mine shaft at Zawar, Udaipur Province.

Valued at £192,750, the contract is for the sinking of a shaft some 990ft. deep, about 2,200yd. of drivage, and the construction of four insets and two or pockets. Work will begin early next year, The main shaft—a 17ft. by 12ft. rectangle—will be sunk with lightweight tubular headgear, and a mucking unit suspended from the surface.

# BUILDING ADVISORY COMMITTEE Preliminary Meeting

A preliminary Meeting
A preliminary meeting, substantially but not yet completely representative of the professional, industrial and commercial sides of the construction industry, was held in London last week.

The purpose was to explore the possibility of setting up an Economic Planning Advisory Council for the Industry. A useful discussion took place and further meetings will be held, it is officially stated.



A Happy Christmas To All Our Readers

# HIGHWAY ENGINEERS' CONFERENCE ON MULTI-LEVEL INTERSECTIONS

AN exhibition and conference on multi-level intersections, organised by the Institution of Highway Engineers with the collaboration of the Cement and Concrete Association, was recently held at the Royal Institute of British Architects in London.

Opening the exhibition Mr. I Singleton

British Architects in London.
Opening the exhibition, Mr. J. Singleton-Green, the senior vice-president (later that day, at the Institution's annual general meeting, he was installed as president, in succession to H.R.H. the Duke of Edinburgh) recalled that at their annual luncheon a year ago the Duke had referred to "even better and cheaper methods of construction of roads, overpasses and underpasses. . ." This had led the Institution to organise the conference. The object of the exhibition was to show the range of what had been done in the Americas and Europe, and what had been done and planned here.

Conference

# Conference

At the conference three Papers were presented, dealing with practice in Europe, the U.S.A., and Britain.
The first was by Dipl. Ing. Peter Misch, from Germany, who discussed some

from Germany, who discussed some technical aspects of elevated road construc-

He began by recalling that traffic was a big problem even in Ancient Rome. Caesar's solution was a law which had survived him for centuries, and, unfor-tunately, still sounded really modern. He tunately, still sounded really modern. He had stopped all load-carrying animals and vehicles entering the inner city of Rome during the day time—not only on Saturdays, as some cities did nowadays. A more positive and still earlier example was provided by Nineveh. The Assyrians had converted their 100ft, high town walls into these lane roads for what they had called three-lane roads for what they had called "express traffic."

Twenty-five centuries later, in Brooklyn, a three-level elevated road was built, bordering on the centre of a city, utilising

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bordering on the centre of a city, utilising a river embankment.

In the meantime Europe had turned to the elevated road which, as town planners had told him. could now be considered a universally accepted instrument of traffic planning in Germany. Forty examples of German elevated roads, with more than 3,000,000 sq. ft. of bridge slab, were quoted to him when preparing the Paper. More than 100m. D. marks had been spent in the seven years since the first German elevated road was built, i.e., the ramp of Dusseldorf's North Bridge, the "milliped." Even some of the autobahn bridges could be classified as elevated roads. Among his be classified as elevated roads. Among his very many illustrations he included part of an autobahn bridge over the Weser at Bremen

Since his Paper did not cover roads in cuttings, he said the second level could only be attained by either the elevated road or by a combination of embankment and bridge. The elevated road was the more economic, as analysis had proved, if it were to be more than 10ft, to 13ft, high. It also offered greater flexibility in ground lant alterations in height were less costly: plan; alterations in height were less costly; good visibility underneath was maintained; less space and lower ground costs were involved, and the space at the lower level could be utilised economically.

These and other considerations had led the construction of prelayered and in

lists and other considerations had led to the construction of an elevated road in Plymouth; an embankment was planned originally which would have been cheaper, but it would not have permitted the utilisation of the lower-level space for the waiting rooms, etc., of the adjoining bus terminal.

Mr. Misch went on to describe and illustrate several aspects of construction. First, building materials. In Germany, all elevated roads erected so far were built in prestressed or rather post-tensioned

concrete. Prestressed concrete was more economical than steel for bridges up to a economical than steel for bridges up to a considerable span—which was never exceeded in this type of construction. Even in the U.S.A., where the situation was less favourable to concrete for bridge construction, a very large number of elevated roads had been built and the vast majority were now being built in concrete. This seemed to confirm that, apart from its other advantages, concrete was particularly suited to the construction of elevated roads because of its adaptability to all the desired forms of construction. All difficulties brought about by the multi-curved shape of the structures and their access ramps and by their continually varying widths could be solved perfectly easily with concrete design.

Concerning technical development, he said that reinforced concrete would in

Concerning technical development, he said that reinforced concrete would in principle be equal to the demands set by the elevated roads, but solutions in prestressed concrete were lighter and more appealing aesthetically. Most important in this connection was the fact that prestressed concrete permitted constructions without joints, whilst at the same time full use could be made of the advantages of building in sections.

The movements of the bearings of these In movements of the bearings of these long and very often curved structures were large and required careful consideration; and the design of the bearings was also affected by the torsion problem. In one elevated road in Germany the weight of the conventional bearings was one-third of the weight of the prestressing steel used. the weight of the prestressing steel used. German bearing manufacturers had adopted an old idea in concrete bearing construction. They had used surface hardened bearing rollers and bearing plates, so that the permissible Hertz pressure could be increased two to three times. The roller diameter could thus become four to nine times smaller. He showed a comparison between an old and a new Kreutz tank steel bearing at the bottom for the same loads.

The same result was obtained by a firm

The same result was obtained by a firm in Esslingen with their Corroweld bearing. They welded layers of stainless steel to the mild steel rollers and plates, but only at the contact zones. Both those products were widely used in Germany. The smaller bearings could be placed wider apart in the same space, and thus could take up larger torsional moments. This became particularly important in structures supported on a central row of columns. For hinged bearings some engineers preferred concrete hinges. These comprised either genuine hinges achieved by reducing the cross-section to a fraction of that of the column (such hinges could be used for angles of rotation up to 1/300), or columns which acted as hinges because of their low stiffness or lower moment of inertia.

# Rubber Pot-bearings

Rubber Pot-bearings

Lead hinges, which were supposed to cope with larger angles of rotation than concrete hinges, were going out of fashion in Germany. Experiments had shown that they were rolled flat if the rotation were repeated many times, even if the angles of rotation were kept small. This could lead to highly unwelcome displacements of the line of application of the load, resulting in cracks in the bridge girder. A big step forward was brought about by the development of rubber pot-bearings. These differed fundamentally from the French rubber bearings, consisting of alternate layers of neoprene rubber and steel plates or steel mesh.

The angle of rotation was up to 1:50; the permissible pressure on the rubber was 2,850lb. p.s.i. These bearings were very shallow, so that no niches or walls were required to camouflage them. The rubber pot-bearings acted as pivot points, or if several were used in line they acted as

line rocker bearings. It was not difficult to design tension-proof hinge-bearings, or bearings movable in one or all directions.

The shape and construction of the supports was closely linked with that of the bearings, and with the form of the cross-section of the bridge. Single legs aligned along the axis of the bridge were widely favoured nowadays. This arrangement had the advantage that the skew of the slabs, which was practically unavoidable in these structures, was eliminated from the statical analysis. Further, little space was required, there was little impediment to the view at the lower traffic level and the structure became architecturally more appealing.

Single supports could be employed for bridges up to a width of about 60ft. The chief construction problem as against twin supports was the absorption of torsion. Either the columns must be wide enough to take up two bearings in the transverse plane or the cross-section of the bridge.

to take up two bearings in the transverse plane, or the cross-section of the bridge must be stiff enough to divert the torsion forces to the ends of the bridge. In the latter case the legs of the bridge could be

made extremely slender.

#### **Exceptional Case**

The Ludwigshafeb mushroom structure could be called an exceptional case of fixed bearings at top and bottom. Three mushbearings at top and bottom. Three mush-rooms were prestressed together through-out, with transverse-force joints between adjoining groups. The two outer mush-rooms of a group stood on four pairs of large multi-roller bearings each, and these permitted a longitudinal movement with-out suppressing the action of the fixed bearings.

bearings.

Bearings fixed at the top and movable at the bottom ("the bridge on roller skates") had been used several times. Using the Hammersmith flyover as an example of this type of support, he said the German Kreurz bearings were used for this structure. The features were temporary strutting of the columns by jacks and plates; additional buffers in case of failure of the bearings; and the possibility of corrections to the vertical alignment in case of uneven settlement.

The roller skate type of support avoided

ment in case of uneven settlement.

The roller skate type of support avoided the need to camouflage the bearings at the top and would be of advantage in bad subsoil conditions. The stressing on the foundation became more favourable, but the bridge deck had to take up correspondingly extra stresses, which as a rule would increase the cost.

Very often, therefore, in Germany the columns were fixed in the foundation and there were movable bridge decks at the

columns were fixed in the foundation and there were movable bridge decks at the top. As one of many examples he illustrated the elevated road Paulinenstrasse in the centre of Stuttgart. This type of support contracted for a relatively large column head, a capital or a hammer-head, unless twin leg supports were employed, as was the case with the ramp of the Cologne Severin bridge.

Just as popular, or even more so, were the pin-pointed supports, which could be made very slender indeed, because of their axial stressing. There were many German examples.

#### Space Required

Discussing the space required for the supports, he said the ratio of the column area (the cross-section at the bottom) to the supported bridge deck varied between 1:50 and 1:500, the average being about 1:150. It was practically independent of the type of bearing and support (single or twin legs). He thought the demand for extra small space for the supports would be made only in exceptional cases. Aesthetic considerations would usually prevail when considering whether round, rectangular or wall-shaped supports would be used. The elliptical type of column often had preference. He illustrated an

elevated road at Dusseldorf/Neuss, with a twin box cross-section on single legs fixed at the bottom.

Every conceivable type of cross-section was used in bridge construction. Massive slabs for spans up to about 70ft., hollow slabs between 60ft. and 100ft.; grillages of main and secondary beams, T-beams, single box beams between 65ft. and 115ft. multi-cellular box beams for spans of over

100ft.

As to quantities of materials, it seemed that for all spans up to about 130ft. about 2 cu. ft. of concrete per sq. ft. of bridge slab was used (excluding foundations). The quantity of steel used for the normal spans between 80ft. and 115ft. seemed to lie between 32lb./sq. ft. and 42lb./sq. ft. The proportion of prestressing steel in that figure varied between 30 per cent. and 50 per cent. it depended on, among other things, whether or not transverse prestressing was used. The latter was very useful if the bridge deck cantilevered out very far.

The thinnest full slab solution and the most slender of all bridge decks in Germany was that of Fischerstrasse at Hanover, a slab with only 20in, construction depth. Another example was the tram bridge in the Mannheim "merry-go-round," a very sharply curved full slab, At Karlstadt on Main there was a slab con-struction with cylindrical hollow channels. The cardboard elements forming the channels must be fastened very carefully to prevent them from rising when the concrete was placed.

# Most Popular

Most Popular

By far the most popular cross-section in Germany—used in 40 per cent, of all the examples he had collected—was the single cell box girder. This seemed to show a clear design tendency. The box girder was particularly suitable for single leg support because of its high torsional stiffness. This form of cross-section and support was preferred in general for bridge decks of 30ft, to 40ft, width, i.e., for decks with traffic going in only one direction. Illustrating some of these structures, he pointed to a temporary "rain roof" on the top of each column that was standing free for some time; its purpose was to prevent for some time; its purpose was to prevent staining of the concrete due to efflorescence.

A very special form of box girder was used in the Schmargendorf bridge in Berlin, used in the Schmargendorf bridge in Berlin, within its urban motorway. The soffit of its three-cell box girder was formed by a tension shell which, contrary to the bottom slab of a normal box girder, carried about 50 per cent. of the load. With a narrower bridge even the two webs of this type of box girder could be left out. The bridge was S-shaped in ground plan, necessitating transverse slopes of up to 6 per cent., which did not show at all from below. Moreover, it would be difficult or impossible to put it would be difficult or impossible to put a different cross-section on a single row of supports. The structure was 92ft. wide more than double the width of the normal bridge structure resting on a single line of

supports.

Coming to forms of construction, Mr. Misch said that, with one or two exceptions, all the German elevated roads had been built as continuous beams with a multitude of bays, avoiding joints as far as possible, because they always required maintenance. Contrary to the Hammersmith flyover, for example, the fixed point was usually chosen in the middle of the bridge or the middle of a construction section in order to halve the movements of the deck at the ends. So far the largest length of jointless sections was 2,000ft. of the deck at the ends. So far the largest length of jointless sections was 2,000ft., in the elevated road Prinzenallee in Dusseldorf. It was a single box girder supported on single pin-pointed legs of elliptical cross-section. Altogether it had 48 bays of 65ft. to 120ft. span, and the construction depth was 3ft. 4in.

On the other hand, the elevated road in Brussels was built as a series of simply supported box girders 4,300ft. long. The side cantilivers were reinforced. The complication of the multitude of joints was set off against the resulting simplification of the construction of the supports. A

thin layer of Neoprene rubber proved sufficient. The girders were dowelled to each other and there was a copper insulation underneath the paving. Two contractors had built the bridge, starting in both directions from the middle; one contractor had worked conventionally girder by girder, concreting the following girder after prestressing is predecessor: the other after prestressing is predecessor; the other contractor put up one girder at its final height, the next in a raised position, and was thus able to manufacture several girders at a time.

was thus able to manufacture several girders at a time.

The speed of erection in Brussels was 10,000 sq. ft. per month, which was very good; in Munich, for the deck alone, it was 20,000 sq. ft. In most cases the columns were cast first and the work was started in the middle, working in both directions by sections of one or two bays at a time. Thus the centring and formwork could be re-used.

Most of his examples were concreted in sections, the longitudinal cantilevers producing strains during construction which were somewhat similar to those in the final stage. The new prestressing tendons were coupled to the old ones; that could be done with the majority of our prestressing systems. Otherwise continuity was achieved by overlapping the tendons or by threading tendons through ducts previously left open and prestressing the "seams" between sections.

The continuous repetition of work when a structure was built in sections permitted savings of formwork and centring and a reduction of the number of men on the job.

Mr. Misch also illustrated examples where a large number of bays had been constructed at a time, and where the outer bays, built on double framework with a sliding layer between, were pushed away from the inner bays, i.e., they were used

outer bays, built on double framework with a sliding layer between, were pushed away from the inner bays, i.e., they were used as prestressing blocks for the Leonhardt prestressing system with concentrated cables. He added that the method of execution could hardly be standardised; it would always depend on local conditions and completion dates.

would always depend on local conditions and completion dates.

As a general observation, he said the edge thickening of the deck was always cast last. It was never incorporated in the longitudinal, and hardly ever in the transverse prestress. The edge thickenings were longitudinally reinforced in most cases, and the necessity for ionis in the were longitudinally reinforced in most cases, and the necessity for joints in the cantilevered parts was now generally accepted. No rules could be given for the placing of concrete in a cross-section, with or without construction joints. Many firms preferred to cast a section in one go with-out construction joints by using retarding agents. The possible cracks in the web agents, The possible cracks in the web due to differential shrinkage of web and bottom slab cast earlier could thus be avoided. But the use of retarders required a lot of experience and attention.

# Special Systems

Next he mentioned two special systems of execution which were likely to be of importance wherever the traffic crossing underneath was particularly sensitive to underneath was particularly sensitive to obstacles. One was the so-called cantilever construction, used in a bridge in the northwest bend of the Berlin urban motorway. He though the system was now well-known; sections were concreted in 10ft. to 20ft. lengths from a shutter trolley rolling on the bridge deck, and the new section was post-tensioned a day or two later back to the preceding section. The pylons supporting the long cantilever arms were necessary in this particular case only because the prestressing of the final stage would not have sufficed for the construction stages. tion stages.

Statically this bridge was a series of 2-bay frames with fully fixed centre and pendulum outside supports. These pendulum supports always stood in pairs, and could hardly be distinguished from the centre supports. Their moment of inertia was only 1/90 of that of the stiff centre supports. No bearings at all were necessary for this bridge of 3,000ft, length, and there were only five expansion joints.

and there were only five expansion joints.

With some know-how, even varying widths and quite sharp curves could be tackled by the cantilever method. even varying The other method of construction was developed with elevated roads particularly in mind. The equipment required consisted of two steel girders, which could cantilever out for one bay under their own dead load; four centring trusses with cross ties and steel formwork rolling on the girders (as on curtain rails); and two crane trolleys. crane trolleys.

crane trolleys.

After completion of one bay, the centring trusses were lowered and the "curain rails" pushed forward to the next bay and settled on the next columns; then the trusses could be pulled into the next bay. This method could cope with slight curves of more than about 1,700ft. radius. A construction depth of 5ft. was required below the bottom surface of the concrete. In all probability both these methods would be used only in exceptional cases. One of their economic advantages, the saving of centring, seemed to be of less importance in elevated road construction

importance in elevated road construction than in bridge construction, where centrings were usually higher and could not always be re-used for bay after bay.

#### Precasting

Discussing precasting he admitted that, so far as elevated roads were concerned, Germany was far behind in this field. America led the way. That was due not only to the necessity for reducing the obstruction to traffic to a minimum, but chiefly to reduce labour costs on site. Under the cost of doubtedly precasting could offer speed of erection and designs which were aestheti-

erection and designs which were aesthetically pleasing. The conditions were favourable for precasting if there were few changes in width and few curves.

Certain difficulties had to be overcome when designing for precasting. A series of simply supported beams would necessarily have a larger construction depth. We must strive for a minimum number of learnests and they had to be straight with

We must strive for a minimum number of elements and they had to be straight; with these elements it was difficult to tackle curves and changes of width.

As a prototype of a good solution he quoted again the Hammersmith flyover, composed of a sequence of small elements assembled on centring and post-tensioned together. The main elements were 10th box girders, interchanging with cantilever units which carried the slabs for the outer parts of the carriageway. The 3in, in-situ parts of the carriageway. The 3in. in-joints were left open, a matter which joints were left open, a matter which fascinated him; those joints offered the possibility of an aesthetically ideal solution, even for sharp curves. The laying of the elements overhead by crane was also well thought out. For 62ft, of width of bridge deck a centring strip was required only 28ft, wide and quite short.

In the final section of the Paper he discussed aesthetics. He said we could be proud to leave our bridges to posterity as genuine examples of the taste of construction of our time he doubted whether that would go for the majority of our other

that would go for the majority of our other buildings, (say) office buildings! But a high price was paid for this in Germany, by shaping each bridge individually; fanatics of rationalisation would rather buy tanatics of rationalisation would rather by them wholesale in a department store! He thought the effort was worth the price, especially for elevated roads. It was worth giving careful consideration to the shaping of the columns: they must

It was worth giving careful consideration to the shaping of the columns; they must look neither too heavy nor too light. He spoke of tapered columns, smaller at the top, "lift up" low bridges with columns made to look slender. Tapering the other way brought high bridges down.

It was undoubtedly worth while to have full scale models made, as was the case for the elevated road Jan Wellemplatz, the eighth and latest, but certainly not the last in Düsseldorf, Germany's paradise of the elevated road.

elevated road.

elevated road.

The view from underneath must also be considered very carefully. Complicated formwork arrangements should receive careful study and should be drawn out beforehand. Nor must we fight shy of the extra cost which might be involved, for instance, from shuttering the webs of box girders with boards at right angles to the axis of the bridge.

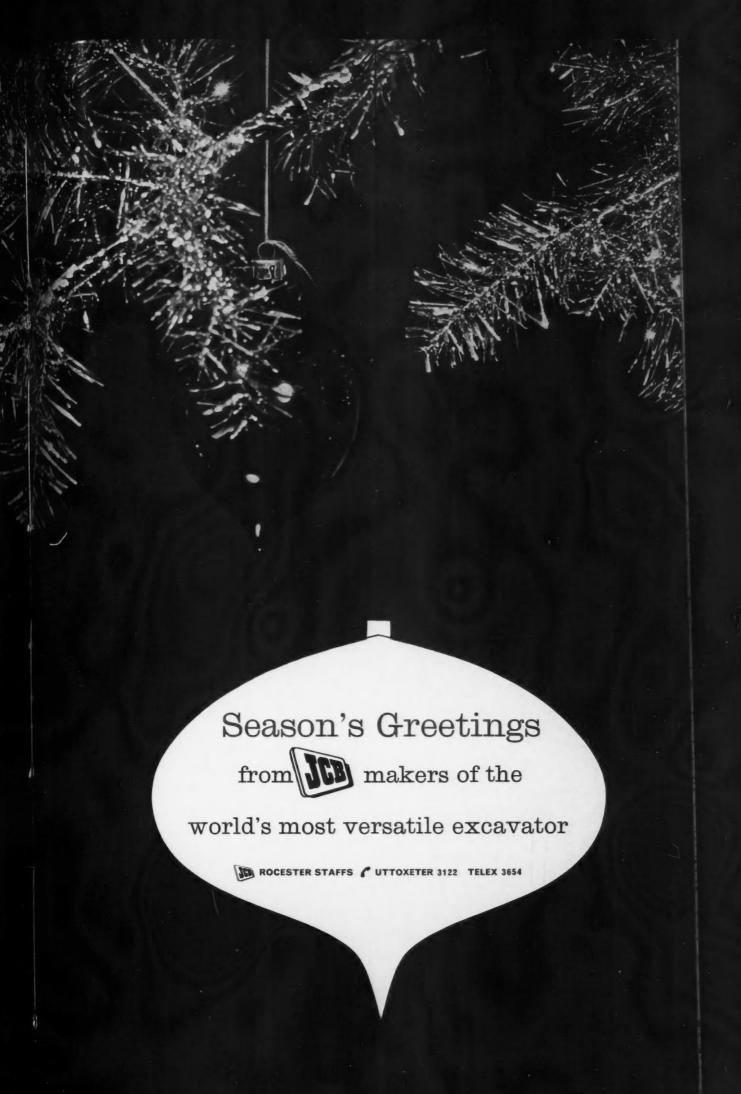
He was also of the opinion that painting the concrete was not a sin or a crime

# 









**Bulk Excavation** 

Trenching

directed against the honesty of the material, even if there were no technical reason for it. The technical development of bridge construction in prestressed contents and the development of bridge the development of bridge the development of crete had permitted the creation of appealing constructions of extreme slenderness and elegance.

#### Discussion

Mr. P. F. Stott said the examples illustrated had been considered from both the traffic and the structural aspects; in his view those two points could not be arated.

separated.

The work on single columns in Germany very clearly pointed the future here as well. The torsional structures had a fundamental to economy. advantage in principle, leading to economy, in that the combination of torsion and

in that the combination of torsion and bending produced very light structures in addition to releasing space beneath. In his view only the simplest problems were solved by the electronic computer; the more difficult jobs had to be done by somebody sitting down and thinking them

Contrasting the pictures of the structures in the U.S. and Germany, his very strong feeling was that what we had to learn from Germany was that the integrated solution was to be preferred. The structure must not drag along behind the road, it must be considered from the beginning. st be considered from the beginning

it must be considered from the beginning as part of the whole solution.

Mr. S. M. Reisser, expressing his interest in rubber bearings, said they had been used for a very large bridge in this country

see for a very large bridge in this country some five years ago.

He illustrated a three-level intersection in Liverpool, of conventional type, but still so simple that he did not think any motorist could go wrong; and a rather unusual intersection on a motorway.

Mr. Seymer asked about public opinion concerning elevated roads in Germany, and whether there had been a lot of

mr. miscn replied that there had been one opposition in Dusseldorf, but public pinion had simmered down. Expert pinions, of course, were divided. Also a case in Berlin there had been opposion, but he believed the result was much be same. Mr. Misch replied that there had been opinion

A. Goldstein said he had noticed from the illustrations that by far the majority of the structures in Germany were post-tensioned. That was a very fundamental and important distinction of which we must take cognisance when planning in this country, because it was not the situation here.

He had also noted particularly the sympathy with which reinforced and pre-stressed concrete had been used in Germany. The treatment in terms of essthetics demanded a sympathy which was present in the examples shown and present in the way Mr. Misch had described them; it was notably absent from many of the examples in the U.S. That sympathy had to extend to the designer and the con-structor, and he wondered how many would want the small temporary roof over free-standing column to avoid stain due to weather, which was shown in one of the pictures. Sympathy was extremely desirable, but we must not forget that it cost money, both in design and construction.

A considerable amount of research work the concrete hinges was being carried out the Cement and Concrete Association.

Mr. Misch felt that in Germany they would have to use the precast method far long in the future of the control of the con re in the future.

As to the sympathy with which re-inforced concrete, etc., was used, it represented such a small proportion of the whole cost that it really did not make uch difference in that respect.

#### PRACTICE IN THE U.S.A.

Mr. Brian Scruby, M. I. Struct. E., M.A.S.C.E., M.Soc.C.E.(France), M.Cons.E., discussed the methods used and the results in the U.S. Like Mr. Misch, he talked around quite a large number of illustrations of intersections.

He said it was interesting to learn that it was not until about 1924 that the Federal Government had completed the

establishment of agencies and were giving financial aid for highway construction to all the then 48 States. In 1940 the first 160 miles of "controlled access" highway, the Pennsylvania Turmpike, was opened to traffic as a toll road, and was quickly followed by others. A 13-year programme covering approximately 42,000 miles of inter-State highways had been under way

for four years.

The rotary (or roundabout) was no longer considered a practical solution to an interchange problem, and it needed little imagination, said Mr. Scruby, to understand how the multi-level intersection

understand how the multi-level intersection had been developed throughout America in many different forms.

On the technology of the subject, he gave a list of definitions of terms used in the U.S. For instance, a "separation" (a structure to carry an intersecting road over or under a freeway), a "ramp" (a roadway connecting a freeway with an intersecting road), a "diamond interchange" (to accommodate turning movements off or accommodate turning movements off or on to a state highway from four directions), on.

He also referred to the "benefit ratio," He also referred to the "benefit ratio," i.e., the overall savings to the motoring public for a 20-year period compared with the cost of the highway project. Savings included reduction in fuel cost, vehicle upkeep and driving time on the new route as compared with the old. For example, if 20,000 cars and trucks per day used a new section of freeway and thereby saved an average of 10 cents per day in operating cost, the total savings to the public over 20 years would add up to \$14,600,000; if the new freeway cost \$5,000,000 for rights of way and construction, the benefit ratio would be slightly less than 3 to 1.

#### Careful Study

Careful Study

The experience gained in the early period of design and construction had led engineers in the U.S. into a phase of very careful design study and a positive approach to interchange construction. The traffic engineer and the highway engineer made a very careful study of every project, and he listed some of the principal factors. One was to produce a design which would give an uninterrupted flow of traffic on an interchange at all times at a speed of 50 m.p.h., with a minimum of 30 m.p.h.

Another was an intelligent approach to

Another was an intelligent approach to public relations, especially to members of the public involved in land acquisition, or living in the vicinity. This often took the form of public meetings, education in schools, publications, display models and schools, publications, display models and press announcements. Again, to make ample provision for the future in the design. A simple and intelligent approach to signs and instructions to drivers. For example, when a vehicle was travelling at 88ft. per second the driver should be given only one choice of direction and the instructions should be no closer than 600ft. wherever possible.

Another point was the acceptance that every interchange was part of a scheme and every interchange was part of a scheme and every scheme part of a master plan. Enlarging on this, he said that throughout his brief, though comprehensive, visit to the U.S. he did not see a single interchange or separation which was not part of a master planned development in both rural and urban areas involving several miles of roadway. Each traffic problem, particularly in urban areas, was dealt with comprehensively as an artery and master-planned from its source, perhaps on the fringe of a large populated area, and designed to finish in the very centre of the city itself. Interchanges, collectors, distributors, elevated sections or flyovers and section in-out all formed part of the plan, whether or not they were all constructed at one time.

He saw nothing like the Hammersmith flyover built in isolation. That had solved a very real local traffic problem and he a very real local trame problem and he was convinced that its design was of the highest order, both technically and aesthetically. But did it go far enough? The very day it was opened we had read of congestion and difficulties at its approaches, resulting in ad hoc emergency measures by the police.

He did not blame the highway or traffic engineers, who were able and anxious to deal with these problems comprehensively, but our overall general approach to the problem, which was hamstrung financially.

Forward thinking traffic and highway engineers in the U.S. were concerned with two other major factors. First, the need to present vehicle drivers with a similar pattern of instructions at all interchanges throughout the country, which, in effect, meant that they should always be requested to make similar changes of direction on entering or leaving a freeway. Secondly, the need to execute that in the safest possible manner.

As a simple example of the first he As a simple example of the first he showed an all directional interchange designed to avoid loops of the cloverleaf pattern. One diagram showed two separate exits turning right and left, with all the resultant disadvantages of weaving on the freeway; another showed only one exit to the right, thus eliminating weaving and at the same time permitting the driver to reduce speed in the more natural right-hand ramp before having to decide on his left or right hand turn.

An example of the approach to exfert

left or right hand turn.

An example of the approach to safety was at an interchange between a freeway and a minor road. The layout shown in one diagram had all the advantages of high speed exit and entrance to the freeway, but involved possibly dangerous and wrong manoeuvres on the cross road. The other showed a more elaborate design but other showed a more elaborate design, but had the advantage of permitting natural turns at the minor road.

had the advantage of permitting natural turns at the minor road.

He went on to illustrate interchanges in three broad categories, i.e., in open country, in urban areas where land values were higher, and in built-up areas where land values were extremely high. In connection with the last category he said that in most of the important cities the freeways and expressways were often brought to the very edge of the central area and in many cases passed through the most heavily built-up districts. Examples of this could be seen in Los Angeles, Chicago and New York, where expressways are planned to cross Manhattan. Interchanges in those areas, he said, were extremely complicated in design, having to combine the ideal capacity and flow with the vital need to conserve land. The problem was to some extent eased by the rectangular pattern of the streets, which enabled whole blocks to be given up to accommodate interchanges and elevated expressways.

One of the most complicated inter-One of

the most complicated inter-One of the most complicated interchanges, and which no doubt would be one of the busiest, is under construction in the heart of Chicago. It is located between four main streets and occupies a complete block approximately 800ft, square. It is all-directional in character; all traffic will flow in an anti-clockwise direction in one gigantic rotary or roundabout, but in separate lanes which merge only at the exits.

#### R.C. Portal Frames

The elevated structures are composed of reinforced concrete portal frames supporting a steel girder superstructure on which rests a 7in. deck slab. The elevated Congress Street expressway passes under the Chicago Post Office building, a feaure which was planned at the time the building was designed. The ascending and descending ramps are 22ft. wide and have maximum grades varying between 6½ per cent. and 7½ per cent. The minimum vertical clearance is only 14ft. 3in.

On the question of construction, he

On the question of construction, he said that in a country so large as the U.S.A. it was impossible to generalise concerning their standards of design in multi-level intersections. Customs varied and were dependent on the availability of materials, dependent on the availability of materials, and sometimes on the manner in which contracts were awarded. In the large steel producing areas there was a tendency to design entirely in steel, except for the concrete deck slab. In an example at Chicago he noted that, except for site joints, the main structure was all-welded. The elevated road carried a freeway from the (Concluded on page 1010)

# An Economist Comments . .

#### LESSON FROM SCOTLAND

SCOTLAND, at present, has an unemployment rate about twice that he rest of Britain. This may seem of the rest of Britain. a far cry from contracting as such; but in point of fact the lesson of Scotland could help to point the way to the future of contracting throughout the whole of Great Britain.

whole of Great Britain.

There has just been published a report\* that contractors should know something about. It is the work of a committee appointed by the Scottish Council (Development and Industry). The committee did not confine themselves to the Scottish unemployment problem, serious as it is, but delved thoroughly into the reasons why the Scottish economy should as it is, but delved thoroughly into the reasons why the Scottish economy should be found wanting—in particular the really worrying question, why did industrial production in Scotland rise by only 13 per cent. between the years 1953 and 1960, compared with the rest of Britain's rise of 30 per cent. and Western Europe's 70 to 80 per cent? The broad conclusion is somewhat startling—"Scotland is suffering in an acute form from the ills to which the whole United Kingdom is subject."

in an acute form from the ills to which the whole United Kingdom is subject."
Before considering the implications for contracting, it is as well to summarise briefly these ills as the committee see them. First, the Scottish economy, like the rest of Britain for that matter, has traditionally been based on "a small quantity specialised article" often for an individual customer—"craftsmen's goods".
Unfortunately, these are not the stuff that breeds the growth industries of today; it Unfortunately, these are not the stuff that breeds the growth industries of today; it is the "large quantity standard" products like motorcars, television sets, refrigerators, canned foods and the like, backed by high pressure advertising and large sales organisations, that do. Second, an outmoded apprentice recruitment system by which training is tailored to suit the requirements of existing industries in a particular area and not industries that might be expected to grow elsewhere. Third, and linked with the second, the Local Employment Act under which the Government subsidises new industries to settle in the areas of highest unemployment but which are, as often as not, decaying but which are, as often as not, decaying areas. Fourth, and of particular interest for contractors, inadequate communica-tions in the widest sense. It is significant that the authors of the report "plotted a that the authors of the report "plotted a line on the map, showing the areas within 3 to 3½ hours' journey by rail or road from London, probably the maximum return journey which can reasonably be undertaken in one day . . . " Between this line, and a second line dividing the country into administrative regions showing more than average growth in terms of more than average growth in terms of employment, they found quite a remarkable correlation. In short, employment tends to concentrate where communications with London are the best.

If Britain enters the Common Market, all the Scottish deficiencies might become relevant to Great Britain as a whole. Naturally, the report contains a number Naturally, the report contains a number of recommendations and it is worth while considering some of these; in particular, their implications for contracting. The first aim, it is suggested, should be to encourage the growth of "new industrial centres and complexes", where the new growth industries can grow; government aid, including the building of factories in advance, should concentrate on new towns, not on the present areas of above-average not on the present areas of above-average unemployment. In the light of the findings, this seems simple common sense. Inevitably it would mean more factory building. But it could mean more than building. But it could mean more than this. Growth and standardisation, it seems, are complementary. Factories, if Britain enters the Common Market, may be required urgently; so may the offices, houses and other ancillary services that \*Report of the Scottish Economy. H.M.S.O.,

to form a new industrial community. go to form a new industrial control of the private developer who is usually in a position to develop a scheme quicker than his public authority counterpart.

authority counterpart.

The next recommendation concerns apprenticeships. To encourage mobility into the new industries and areas, it is stated, a fundamental review is required of "outdated apprenticeship and craft systems." The contracting industry can scarcely be accused of impeding mobility in this way. But if the whole country's apprentice and craft system should come under the microscope, the industry could not altogether avoid the consequences. Five years as a period of apprenticeship for a building craft may be too long; educational standards have changed a lot since that period was formed. In the same way, it can be argued that the industry would be all the better for a wage structure that provided higher monetary rewards for the above-the-average craftsman.

the above-the-average craftsman.

As to improving communications, it was only to be expected that the committee would insert a plea for more arterial roads; to link the new Scots industrial centres to link the new Scots industrial centres with the expanding industrial centres of England. Presumably, if they had been dealing with England also, they would have been in favour of improving cross-Channel links—a Channel tunnel, or a Channel bridge. At any rate, on the committee's findings, the Government may shortly have tangible evidence of the shortsightedness of the country's present road building achievements.

#### Commissions for Architects and Costs

THE latest figures of new commissions THE latest figures of new commissions for private architects provide little encouragement. According to the R.I.B.A. the estimated value of new work commissioned of private architects in the period July-September, 1961, is £250m., which represents a fall of only 1 per cent. over the previous quarter. This change is not significantly different from the modest increases of 1 per cent. and 2 per cent which occurred between the second and third quarters of 1959 and 1960 respectively.

The apparently stable overall position is the result of a further fall in the value of commissions for private owners and developers combined with a substantial increase in commissions for public authorities by comparison with April-June, 1961. However, by comparison with the third quarter of 1960 there has been a drop,

ties by comparison with April-June, 1961. However, by comparison with the third quarter of 1960 there has been a drop, overall, of 9 per cent.

I have two comments to make on these latest figures. First, they show that the private architect, like the small and medium-sized builder and contractor, is the more vulnerable to changes in the demand for construction work. Second, I would ask what measure of costs was used by the architects included in the survey? If it is the official Index, then their answers are likely to err on the low side. If, on the other hand, they have based their answers on the general run of tender prices now being submitted, then the position is likely to be appreciably less stable (and less satisfactory) than the stable (and less satisfactory) than the R.I.B.A. inquiry would lead us to believe. The truth is that the cost position is in a bit of a muddle at the moment; certainly there is considerable confusion on the part

there is considerable confusion on the part of contractors, architects, quantity surveyors and building owners. It may help if I explain the position briefly.

First, it is necessary to appreciate that the official Index of Building Costs is precisely what it says it is; an index of building costs at any one time, not an index of building prices. The main constituents of the Index are (a) the cost of building labour, (b) the prices of building materials and (c) a fixed percentage addition to cover overheads, profits, etc. The overall increases under these headings, on

the other hand, are offset by changes in building productivity. Thus if the basic constituents of the Index rise by, say 7 per cent., and productivity rises by 7 per cent. over the same period, the net increase in building costs, according to the official Index, is NIL. This explains why the Index has risen a mere 1 per cent. since 1958, to the chagrin of many contractors doing post-completion exercises on variadoing post-completion exercises on varia-

of course the official Index may be alright for the Government looking at the £2,500m. annual programme as a whole; but it is a very different thing when it is applied to individual contracts. By no means all contractors would subscribe to the view that productivity is rising at anything like the rate that the official figures suggest. Nor does the Index, as at present calculated, make any allowance for those contingencies and unknowns that face contractors on almost any contract, particularly if it is a firm price one—premium wage rates, or additional costs arising from arly if it is a firm price one—premium rage rates, or additional costs arising from wage rates, or additional costs arising from delays in the delivery of materials, and forseeable changes in overheads, and so on. Nor does it reflect, in any way, a transition from a period of underpricing. like 1958, to a period of more economic prices (at least for some contractors), like 1960 and 1961.

This is roughly the present position; it is much more difficult to suggest a remedy. A separate Index based on basic costs only, A separate index based on basic costs only, would probably help. Eventually, too, tendering may stabilise at more economic levels, in which case, the Index, as it is at present framed, or in a way that reflected changes in basic costs only, would more accurately reflect tender prices. But this is long-term and for the present it seems that the best course for contractors, whether pricing tenders, or calculating the cost of variations, is to appreciate what the present official Cost Index is, its scope and its limitations. I hope my explanation its limitations.

#### Women's Wages

So much attention has been given to the failure of the Chancellor and the T.U.C. to agree about the National Economic Development Council that there has been a tendency to overlook a significant reference by the Minister of Labour

women's wages.

Mr. Hare was asked by the T.U.C. to Mr. Hare was asked by the T.U.C. to ratify the International Labour Convention on equal pay for women. He replied that it would be contrary to long-standing United Kingdom policy to ratify a convention when existing practice did not conform to its provisions; and that to legislate would also be a complete change of policy since the matter had hithertn legislate would also be a complete change of policy, since the matter had hitherto been generally regarded as one for collective bargaining. Nevertheless, Mr. Hare did go further than this. He reminded the T.U.C. that the subject would come up in the Common Market negotiations since the Treaty of Rome provides for it. Surely this must be construed as a hiat that the Union leaders should wait for equal pay to come in with the Common Market. Market

Market.

In the light of Mr. Hare's remarks, I took another look at the National Working Rule 1(1) Female Operatives. The standard rate for women aged 19 and over engaged in craft processes is 10½d. an hour below the grade A standard craft rate; and the corresponding rate for women engaged on work other than craft processes is 4d. an hour below this. So, if equal pay is introduced under the Common Market or elsewhere, there is likely to be a sizeable rise in hourly rates for the 40,000 or so women which, the Ministry of Labour suggest, work as operatives in the construction industries in Great Britain. I leave individual contractors to work out how many of the 40,000 they, themselves, employ and what effect it will have on their wages bills.

# THE USE AND ECONOMIES OF TOWER CRANES FOR THE SMALLER CONTRACTS

By H. G. Vallings, A.M.I.Mech.E.\*

 $B^{\text{EFORE}}_{\text{ crane, a builder will want to ask himself "On what sort of contracts will}$ 

crane, a builder will want to ask himself "On what sort of contracts will it be an advantage to use a tower crane?" and "Will it pay me?"

Cranes offer three possible advantages. They can lift heavier loads than are easily moved by other means and place them in their final position on the building. They can often save money by handling materials more cheaply (but this depends on how intensively they are used). Thirdly, because they can move loads both horizontally and vertically, they can usually handle materials faster: this can sometimes obviate "bottlenecks" in supply. This third attribute is an important one, because it affects the time sequence in the building programme and therefore the whole organisation of the work. It is in fact by helping to speed up construction that a crane may produce savings greater than any that could be made by a reduction in handling costs.

First of all, let's consider how a tower crane handles various building materials and what sort of performance can be expected.

what sort of performance can be

For practical purposes, the weight that it can lift to all parts of a building can be taken as the maximum safe working load at full reach of the jib. The number of loads that can be lifted per hour depends not only on the speed of the crane movements and height of lift, but also on the time taken to attach the load to the hook and unload it on the building. Take precast concrete or prefabricated components, for example. If they are provided with lifting eyes, it is a simple matter to hook on or detached a chain sling.

Lifting eyes are particularly useful in expected.

hook on or detached a chain sling.

Lifting eyes are particularly useful in handling unsymmetrical or awkwardly-shaped components easily and without damage; if they are not provided, slings have to be passed around the components—sometimes a lengthly operation. If the two lifting points are far apart, as with a long beam, a sling with very long legs may be required to limit the included angle between them: and this reduces the maximum than the strength of th between them; and this reduces the maximum height to which the beam can be raised with a given crane.

The distance between the crane hook and the load can be reduced by using a

\*Talk given during the recent Building Exhibition at Olympia.

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spreader beam connected to the hook by an eye at its centre or by a short sling. Spreader beams can be made with their lower slings quite short and attachable at several positions.

When positioning a wall panel or precast column, a temporary fixing must often be made to hold the unit upright before the slings are released. If this can be done quickly, the operation need not delay the



Fig. 2. Lifting packed bricks from lorry. Safety cage is swung down to enclose load when lifting overhead

crane unduly. This fixing may be by a stay or stays, secured to the building before the arrival of the unit.

Small components such as lintels and door hoods can be lifted and placed in position with a "scissors" lifter.

A variety of crane skips is available for in-situ concrete work. A skip with a

discharge door is generally more useful than the tipping type, because its discharge can be controlled and it can be used for placing concrete into shuttering as well as into foundations. If the skip has side discharge, as opposed to bottom discharge, it is particularly useful when concreting columns or walls where the reinforcement protrudes some distance above the top of the shuttering. For concrete of low workability, a skip needs to have steeply sloping sides and a discharge mouth of generous proportions. The laydown type of skip usually has these characteristics and yet is still low enough for filling at a standard mixer.

In the interest of efficiency it is desirable to lift a complete batch of concrete at a time. This means that the size of the mixer should match the capacity of the crane—or vice-versa. It is often a help to use one of the lightweight skips now on the market, to enable the maximum amount of concrete to be handled.

The use of large units of shuttering, with a consequent saving in the costs for erecting and striking, become practicable when they can be handled by crane (Fig. 1).

erecting and striking, become practicable when they can be handled by crane (Fig. 1). Reinforcing steel can be handled in Reinforcing steel can be handled in bundles or in prefabricated sections. Hollow clay flooring blocks of the in-situ type can be lifted direct from the lorry to the floor under construction with a crane-fork, and with a considerable saving in time.

in time.

Bricks and blocks are materials which are usually loaded on to the building or scaffold in advance of the bricklayers, and the most efficient way to handle then is in packs secured by a steel strap. The packs can be lifted by their straps in special lifting cages—direct from the lorry to the building, if deliveries are carefully timed (Fig. 2). Another method is to preload bricks or blocks on to pallets and lift them in another type of cage. Quite a large number of pallets are usually required. required.

required.

In contrast to bricks, mortar has to be supplied while the bricklayers are at work. One method is to deposit about 1 cu. ft. of mortar on each spot board from a skip, but this may take up too much of the crane's time. Another method which takes up less crane time, is to deposit the whole skip load into a wet hopper on the building for subsequent distribution to the brick-layers by wheelbarrow.

layers by wheelbarrow.

Instead of handling timber in bundles, it may be worthwhile to pre-assemble units of floors or roofs and place them in their final positions.

of floors or roofs and place them in their final positions.

All materials should, of course, be placed on the ground within reach of the crane and preferably as near as possible to their ultimate destination—to minimise the amount of travelling the crane has to do. It is often worthwhile to draw up a plan for the stocking area. for the stacking area.

#### Rate of Handling

Rate of Handling

In practice, with an experienced crane driver and slingers, and given good organisation, most materials can be handled at the rate of three minutes per load. Some loads take a bit longer—as when pouring concrete to columns, or placing a large fabricated unit. But for planning purposes it is reasonable to assume that a tower crane can operate on a time cycle of five minutes per load or 12 loads per hour. If we take, as an example, a tower crane that can lift 12cwt. at full reach, or say 10cwt. of building materials (allowing for the weight of the sling or lifting attachment), then it could handle 12 x 10cwt. or 6 tons per hour. If the crane runs on rails it could probably serve a working length of about 200ft. at this rate of handling. For a crane of similar capacity on crawler tracks, the working length might be about half this for the

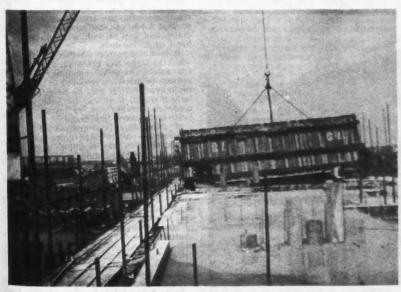


Fig. 1. Handling a large unit of shuttering

£7 1

same output, on account of its slower travelling speed. In the case of the cranes on pneumatic tyres which normally have to be partly dismantled before they are towed to a new position and can only be operated as fixed cranes, allowances must be made for these moving operations when estimating their performance in relation to a given building and its length (First 3 given building and its length (Figs. 3

#### **Operating Costs**

The capital cost of the cranes we have been talking about is high compared with peen talking about is high compared with that of other plant normally owned by small or medium-sized builders. The justification for buying one will depend on a number of factors, primarily on the extent to which the crane can be used in the class of work that a builder usually

the class of work that a builder us u all y undertakes. If a crane is required for work of short duration only, it will probably be cheaper to hire rather than buy.

rather than buy.

If a builder has had no previous experience in using a tower crane, he will want to make an estimate of its operating costs before he decides whether to buy or hire. There are of or hire. There are, of course, many ways of estimating operating costs. If the of estimating operating costs. If the capital cost is written off over a short period (much shorter than its useful life), with no allowance for re-sale value, the re-sale value, the operating cost may appear to be very high. The Building Research Station made a survey of various types of plant and the costs that had a ctually been incurred in owning and running them. From this is was possible to arrive at a figure for the average annual cost of owning various types of crane. This annual cost includes

the average annual cost of owning various types of crane. This annual cost includes replacement, interest, maintenance, insurance and management—in other words the costs which do not vary greatly however much the crane is used. For railmounted tower cranes the average annual cost worked out to 14 per cent. of the current new cost of the machine.

By way of example, let's consider a railmounted tower crane, capable of lifting 12cwt. at a radius of 60ft. and to a

height of 70ft. to 80ft., costing £3,000. The annual cost, 14 per cent. of £3,000, would be £420. If the contractor needs 250ft. of rail track, a concrete skip, a brick lifter, "scissors" lifter and slings, the new price of these would be about £750 and the annual cost about £140, making the total annual cost of crane and equipment about £560. ment about £560.

To arrive at the operating cost, allowance must also be made for electrical installation and supply, day-to-day maintenance, consumable stores, transport to and from site and erection and dismantling.

If we assume that it cost £100 to erect and dismantle the crane, £100 to lay and



4. Concrete runway to facilitate movement of crane (after being partly dismantled as in Fig. 3)

dismantle the rail-track and that the crane works on two sites in a year, this would add £400 to the yearly operating cost. If we allow £45 for transporting the crane to these two sites and assume that it is at work for a total of 150 days per year, we can now make an estimate of the daily operating cost of the crane.

Estimate of daily cost of operating crane, track and equipment

£ S. 1/150 of annual cost, £560 .... 1/150 of cost of erection and

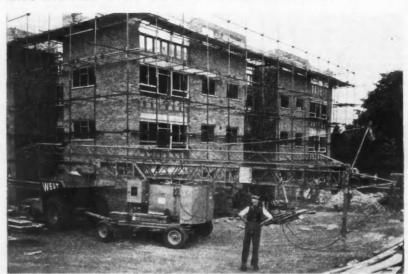


Fig. 3. Moving a small tower crane with the aid of a dumper

dismantling of crane and track (twice), £400 per annum 1/150 of cost of transporting	2 13
crane, £45 per annum	6
1/150 of cost of consumable stores, £15 per annum Electric power, including in-	2
stallation	5

(without driver)

On the same basis—150 days working time on two sites per year—one could make an estimate of the operating cost of a smaller tower crane on pneumatic tyres, capable of lifting 8cwt. at 40ft. radius to a height of about 50ft.

Annual cost of crane, 14% of	£	S.
£2,000 Annual cost of lifting attach-	280	0
ments attach-	40	0
	£320	0
Daily operating cost 1/150 of annual cost, £320 1/150 of transport cost, £15 Allowance for erecting, dismant-	2	s. 3 2
ling and moving on site Allowance for consumable stores Electric power, including in-		10
stallation		4
	£3	0
c. 111	-	-

#### (without driver)

#### Choice of Crane

Choice of Crane

The selection of the type of crane will depend as much on site conditions as on the design of the building. One requirement is that it should be able to cover the whole working area and be capable of lifting and placing the heaviest component, or alternatively, a load sufficient for economic operation. The plan size of the building will affect the decision whether to use a fixed or mobile crane. On some sites it may be impracticable to lay a level track for a rail-mounted crane, but possible to use a crane on crawler tracks, On occasions when the operation of any kind of mobile crane is impossible, the fixed of mobile crane is impossible, the fixed crane outside or inside the building, or a climbing crane may be the answer.

Another factor affecting choise is future work. Some builders who have bought small cranes wished later that they had bought larger models which have a wider application.

#### Applications of Tower Cranes

Applications of Tower Cranes

The main use of cranes is in the building of shells of structures. Once the roof is on, the crane cannot place materials within the building. Occasionally it is possible to use the crane to load the floors with cladding or partition materials as the structure is being built. Sometimes out-rigger platforms are erected at floor levels so that loads can be landed on them by crane, and moved within the building by hand or in barrows.

It is questionable whether it is worth

crane, and moved within the building by hand or in barrows.

It is questionable whether it is worth while to keep the crane on the site for the sole purpose of handling the small amount of materials required in the finishing operations. It may be better, particularly if useful work can be found for the crane on another site, to install a cargo hoist and remove the crane.

If a building is composed of precast concrete or prefabricated units, too heavy to manhandle into position, a crane is essential. If the building has several stores and access is limited and on one side only, then a tower crane is an obvious choice.

For in-situ concrete structures, there may or may not be an advantage in a crane over a hoist. But if, for example, the job includes a considerable number of in-situ walls, for which the same shuttering could be used many times, it may be an advantage to use wall-length prefabricated shuttering and, therefore, a crane to handle them, thereby making savings in the time and cost for erecting and striking the shuttering.

In traditional building, a crane cannot (Concluded on page 1011)

# BUILDING RESEARCH STATION DIGEST No. 17

#### Aerated Concrete — 2: Uses

THE structural uses of aerated concrete, in the form of precast building blocks and of reinforced units, are dealt with in this Digest. It also de-scribes the use, for thermal insulation work, of aerated concrete cast in situ. This Digest and Digest 16 (which described the manufacture and properties of aerated concrete) together supersede

of aerated concrete) together supersede Digests 28 and 29 of the first series. The structural use of aerated concrete has been most highly developed in Scandinavia but has also extended considerably in many other countries and, as indicated in the previous Digest, it is developing rapidly in the United Kingdom. in Sweden, where aerated concrete is used in a high proportion of present-day build-ing, four methods of construction are

(i) Buildings of two or three storeys are constructed with load-bearing single-

are constructed with load-bearing single-skin walls about 10in, thick, of aerated-concrete blocks laid in mortar.

(ii) Other buildings of similar height are constructed entirely of reinforced aerated concrete, i.e. with walls, roofs and floors consisting of reinforced slab units and beams.

(iii) Non-load-bearing slabs or blocks

used as infilling for framed struc-

(iv) Blocks of the lighter grades of aerated concrete are used as permanent shuttering to clad normal reinforcedconcrete structures, thus providing over-all insulation.

With all four methods, the aerated concrete either rendered externally or treated ith a decorative finish applied by spraying.

spraying.

In the United Kingdom, aerated concrete has been made and used for the past 10 years or more, chiefly in the form of building blocks for the inner leaf of cavity walls, partitions and similar purposes. The range of products, however, has gradually been extended to include reinforced floor, roof and wall units, and their potentialities have already been demonstrated in various mototype buildings. The units do not nave arready been demonstrated in various prototype buildings. The units do not differ greatly from those made abroad, either in properties or in methods of manufacture.\*

manufacture.\*

It is recognised, however, that the conditions of use may differ considerably, because of differences in purpose, design, detailing, workmanship, building traditions and climate. For this reason, the performance of aerated concrete as made and performance of aerated concrete as made and this equation. used in this country is being studied independently by means of field observations and laboratory tests.

#### Precast Building Blocks

For most purposes it is essential that precast aerated concrete blocks (and other units) should be high-pressure steam-cured units) should be high-pressure steam-cured (autoclaved) in the process of manufacture, since it is only by this means that the requisite strength and low drying shrinkage can be achieved in conjunction with lightness in weight and the corresponding thermal insulation. Blocks used for the insulation of cold stores are a possible exception, since for this purpose strength and shrinkage may be only secondary conerations.

The blocks are made in various sizes, hicknesses and weights, with properties generally as indicated in Digest 16. They semerally as indicated in Digest 16. They are not yet covered fully by any British Standard; B.S. 1364 (Aerated concrete building blocks) relates only to their dimensions, and B.S. 2028 (Precast concrete blocks) does not at present provide for aerated-concrete building blocks. In the absence of any further Standard for these blocks they may if of appropriate these blocks, they may, if of appropriate

The names and addresses of British manu-acturers of the products mentioned in this Digest may be obtained from any Building Centre

strength, weight and drying shrinkage, be regarded as suitable for the same uses as lightweight-aggregate concrete blocks of types B and C (B.S. 2028), i.e. for load-bearing walls and for non-load-bearing walls, partitions and panels, respectively.

For external walls of cavity construc-tion, the blocks may be used either for both tion, the blocks may be used either for both leaves or for the inner leaf only; in the latter case, any normal walling may be employed for the outer leaf. Aerated concrete should not, however be used below ground d.p.c. level. If used for the outer leaf, the blocks should be rendered or otherwise protected to reduce water absorption. As with other materials, care should be taken in the design of flashings, etc., to prevent entry of water at vulnerable points. Apart from the possibility of moisture penetrating to the inner surface, wetting of the material reduces its compressive strength and its thermal insulation.

The structural recommendations for

The structural recommendations for load-bearing masonry walls are included in B.S. Code of Practice C.P. 111 and are applicable to aerated-concrete block walls. The lowest average strength recommended for blocks is 400lb./in.², tested wet. While strengths of this order are usually adequate for domestic construction, the strength for domestic construction, the strength specified for any given purpose should be chosen according to the loads to be carried and the thickness needed to give the thermal insulation required. Details of the properties and use of aerated-concrete blocks are given in data sheets issued by the manufacturers.

#### Contraction joints

In long unbroken lengths of block walling, contraction joints should generally be provided at intervals of about 20ft. They may be formed either during construction or, since the blocks are easily cut, by cutting into the wall to a depth of about 11in.

As with other types of concrete blocks, the use of strong mortars in aerated concrete blockwork is not advisable. Weaker mortars distribute the effect of movements mortars distribute the effect of movements due to drying shrinkage and other causes and so help to prevent cracking. For most internal work a 1:2:9 or even a 1:3:12 mix of cement, lime and sand is sufficiently strong; alternatively, a 1:4-6 mix of masonry cement and sand or a 1:8 mix of cement and sand with a mortar plasticising agent, may be used.

Plastering and rendering Aerated concrete may contain up to 12 per cent. of moisture when delivered to the site and will take up more water if exposed to the weather in the stack or if exposed to the weather in the stack or during construction. As the structure dries out it will shrink and, if it is plastered too soon, the plaster is likely to crack. The obvious precautions (which apply equally to other lightweight walling materials) are to see first that the materials do not become needlessly wet in storage or use, and secondly that plastering is not begun until most of the drying shrinkage has taken place. has taken place.

It is general practice in Sweden to allow as much as two or three months to elapse between building the walls and applying the plaster or rendering. Heating appliances are often used to hasten the drying, especially in winter; such heating, however, needs to be accompanied by good

Some types of aerated concrete have a high suction which may make it more difficult to ensure good adhesion of the plaster. It is undesirable, for the reasons plaster. It is undesirable, for the reasons explained above, to try to overcome the suction by wetting the surface excessively. However, satisfactory results can be obtained for internal plastering, by the application of a bonding agent before plastering or by using one of the special plasters that have been recently developed

for the purpose; for external rendering, high suction can be overcome by applying a spatterdash of 1:2½ cement: sand an hour or two before rendering.

The satisfactory condition of much of the plasterwork seen on aerated-concrete
walls in Sweden is probably due in large part to the practice of drying the work thoroughly before plastering, but partly also to the development of special plasters and techniques, for example, the use of rendering mixes "activated" by high-speed mixing, which has not yet extended to this country. Special measures, however, are needed only when the material has high suction; apart from this, adequate drying of the blockwork is generally sufficient to of the blockwork is generally sufficient to ensure satisfactory results from ordinary mixes and techniques. In general, the mixes for plastering and rendering should not be stronger than the blocks themselves, but with this reservation a wide choice is available. For internal plastering, for instance, the mix may be (a) an undercoat of 1:2 browning plaster and sand with any normal type of finishing coat, (b) an undercoat and finish of a proprietary lightweight plaster, or (c) recommended mixes of one or the other of the special plasters mentioned above. tioned above.

For external rendering, a cement-sand spatterdash (if required) can be followed after one to two hours by an undercoar of cement, lime and sand ranging in composition from 1:1:6 to 1:2:9 by volume, according to the season, the degree of exposure and the density of the blocks. exposure and the density of the button.

The finishing coat can be of the same composition. Other decorative and procomposition. Other decorative and pro-tective treatments suitable for ordinary concrete can also be applied to aerated concrete. The makers of blocks are pre-pared to advise on plastering and decora-tive treatments suitable for their own products.

#### Insulation of cold stores

Insulation of cold stores

Aerated concrete blocks may be used as an insulating lining for the walls and floors of cold stores. Blocks for such purposes should be of a low density, say about 25lb./ft.³; the thickness will depend on the amount of insulation required. They should be dried, if necessary, before use. Before they are laid, the inner surface of the main wall which will be in contact with the blocks should be coated with bitumen, to prevent the inward passage of moisture either through direct penetration or through interstitial condensation; this moisture would otherwise reduce the insulation of the blocks and might ultimately cause breakdown by freezing. The blocks should be laid in an air-entrained or other lightweight mortar, to entrained or other lightweight mortar, to ensure that the thermal transmission of the joints does not differ very much from that of the blocks themselves.

Similar blocks can be used for insulating floors. A damp-proof course must be laid on the site concrete under the blocks. The floor is completed by laying a normal cement-sand screed or layer of concrete over the blocks to receive an asphalt finish. The thickness of the screed or concrete must be sufficient to concrete the screed or concrete must be sufficient to concrete the screed or concrete. must be sufficient to ensure that any con-centrated loads due, for example, to trolleys or stored material, will not crush the insulating layer. Precast blocks or structural roofing units can also be used for the ceilings.

#### Precast Reinforced Units

The scope of aerated concrete in build-In a scope of aerated concrete in building construction has been extended considerably in recent years by the successful production of autoclaved reinforced units in a variety of forms, including flexural members spanning up to 20ft, and capable of carrying heavy loads.

Manufacturers have paid special attentions

Manufacturers have paid special atten-tion to the problem of protecting the reinforcement from corrosion and have developed proprietary treatments which

are applied to the steel before the concrete is cast. Tests at the Building Research Station have shown that the methods of protection used by the two principal manu-facturers of reinforced units can be regarded as satisfactory for normal condi-tions of exposure in building. The bond strength of the protected reinforcement is low and, for this reason, end anchorage is employed. These and other aspects of the structural efficiency of the reinforced members were discussed in a Paper\* read before the Institution of Structural Engi-

Reinforced floor, roof and wall units are now being manufactured in the United Kingdom, in the range of sizes shown in

a lift shaft after completion. Structurally, it carries a large part of the design load. The remaining load-bearing structure consists of a reinforced concrete frame or a cast in-situ panel construction clad with aerated-concrete wall panels. Since neither the latter nor the partitions are load-bearing, this construction allows a wide scope for variation of floor plans.

In the United Kingdom up to the present the reinforced units have been used mainly for industrial buildings and the blocks for houses. It is likely, however, that reinforced units will in the future be used in this country for multi-storey blocks. Handling

The cellular structure of aerated con-

directly on the aerated concrete or, if there is any risk of crushing of a weak aerated concrete under traffic, on a screed of ordinary cement mortar laid over the hardened concrete. For occasional foot traffic on roofs, the asphalt itself may afford sufficient protection against crushing.

sufficient protection against crushing.

The use of aerated concrete (among other materials) as a roof decking to receive a built-up felt roof covering was discussed in Digest 8 (second series) Special reference was made to the risk of defects due to shrinkage movements of decking and the entrapment of water, and appropriate precautions were suggested. The same warnings apply, in some degree, when the roof covering is asphalt—particularly regarding the entrapment of water.

In-situ aerated concrete may also be used, instead of the precast blocks or slabs mentioned earlier, for insulating floors of cold-storage buildings. The density of the concrete for this purpose is similar to that used for roofs. The precautions needed are the same as those described for blocks.

When the material is used for insulating hot water or steam pipes below ground, it is usual first to wrap the pipes with corrugated paper. This, in conjunction with other expansion devices, makes allowance for the movements of the pipes. Before the aerated concrete is poured, the duct is lined with bitumen felt carefully lapped and sealed, and the felt is also subsequently wrapped over the top of the set concrete and sealed, with the object of excluding water completely.

It is important that the concrete should be kept dry, both to preserve its insulating value and to prevent corrosion of steel pipes. The work therefore needs to be carefully supervised to ensure that the felt lining is everywhere made watertight and that it does not get perforated accidentally. This method of insulation has been widely used and, on well drained sites, it is reported to have proved quite satisfactory. It is not recommended, however for sites where the ground around the duct is liable to become waterlogged.

A few years ago, a series of failures It is important that the concrete should

A few years ago, a series of failures occurred in several district heating schemes where copper distribution pipes below ground were embedded in foamed concrete. The pipes developed longitudinal cracks and consequently leaked. The cracking was found to be due to stresscorrosion of the copper, set up by a com-bination of several factors—residual stress in the pipe (apparently produced in manufacture), the use of a foaming agent that released a small amount of ammonia on mixing with Portland cement, and the use of copper containing very small amounts of phosphorus. The trouble has now been obviated by using non-protein types of foaming agents, which do not produce ammonia. Stress-corrosion can also be avoided if the copper pipes are suitably annealed, or phosphorus-free.

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#### TABLE 1 REINFORCED AERATED CONCRETE members manufactured at present in the United Kingdom Range of sizes of members

Type		Length	Range of dimensions Width (in.)	Thickness (in.)
Roof and floor units	***	Up to 20ft, 5in	18-24	3-12
Wall units (loadbearing)		7ft. 6in. to 20ft. 5in.	18-24	3-12
Partitions (non-loadbearing)	***	7ft. 6in. to 20ft. 5in.	18-24	3- 4

So far, most of the practical experience in building with reinforced aerated con-crete has been gained abroad. The following notes indicate the range of its application.

Small dwellings

For dwellings up to three storeys, reinforced aerated concrete units have been widely used in Scandinavia and elsewhere as load-bearing walls, floors and roof slabs.

Industrial buildings

In Sweden at present, 70 per cent. of all industrial roofing is constructed of reinforced aerated concrete units, mainly because of their lightness, thermal insulation and rapid erection. Wall units placed horizontally one on top of another are used for non-load-bearing panel filling, and storey-height vertical panels jointed by grout along the vertical edges are used for load-bearing walls.

Multi-storey buildings

Multi-storey buildings
For multi-storey buildings, aerated concrete is used as roof-slabs, covered by asphalt or roofing felt, and also frequently as floor slabs. The latter are usually covered with a cement-sand screed. Reinforced aerated-concrete wall slabs of storey height are used for the outer (usually non-load-bearing) walls and also for partitions. In some tall point blocks in Sweden, the construction is based on an ordinary reinforced concrete tower which ordinary reinforced concrete tower which is first erected on the site with the aid of sliding shuttering. This tower serves as support for a tower crane and also as a service duct during construction and as \*A. Short and W. Kinniburgh: "The Structural Use of Aerated Concrete." Structural Engineer, 1961, 39 (1), 1-16.

crete, which makes it lighter to handle and easier to work than dense concrete, also inevitably makes it more susceptible to damage during transport and erection. to damage during transport and erection. Reinforced members, if damaged sufficiently to expose the reinforcement, can deteriorate rapidly, and accidental breakage cannot readily be repaired. Site operations, therefore, should be strictly supervised to see that structural members are handled with due care and not allowed to stand exposed to the weather.

Manufacturers have developed numerous devices to facilitate the handling, erection and protection of the units, and also various drilling and cutting tools.

#### Cast in-situ Work

Aerated concrete cast in situ is used mainly as a convenient means of providing heat insulation. Since it cannot, when so used, be cured by autoclaving, the material inevitably has a high drying shrinkage and due allowance must be made for this. For in-situ work, the foam method is more suitable than the aluminium powder process or other chemical processes, and it is the one that is generally adopted. Aerated concretes are used in situ as insulating layers or screeds on flat roofs or floors, and for insulating hot water or steam

As an insulating layer on flat roofs, the As an insulating layer on flat roofs, the material may be used at densities from 25lb./ft.<sup>3</sup> (dry) upwards—the lower the density, the better the insulation for a given thickness. It is readily screeded to falls up to 1 in 8. After placing, it should be allowed to harden and dry before any subsequent work is carried out. A waterproof covering is necessary; if asphalt is used for this purpose, it should be laid on sarking felt. This may be laid either

#### INDUSTRIAL RESEARCH IN MANUFACTURING **INDUSTRY**

THE Federation of British Industries, in conjunction with The National Institute of Economic and Social Research have prepared "Industrial Research in Manufacturing Industry 1959/60"—the first investigation to attempt a qualitative as well as quantitative analysis of research and development in British manufacturing

industry.

Mr. C. Freeman and Mr. R. W. Evely of the N.I.E.S.R., worked for a year in analysing questionnaires and samples which would provide information on the research pattern in different industries; the breakdown of research expenditure into basic and applied research; the growth of research departments in different indus-

tries; the effect of Government expenditure on research in industry and the relation-ship of research to growth.

On the basis of this information two

commentaries were written, one by Professor Bruce Williams on behalf of the N.I.E.S.R., and one by Mr. G. A. Dummett, the Chairman of the Industrial Research Committee of the F.B.I.

#### Some Findings

Some of the findings of the survey are listed below:

The survey has shown that as much ex ne survey has shown that as much expenditure is being devoted to basic research and new products as to improvements in existing products and processes.

Despite the fact that the science based industries and large firms account for most

of the recent expansion in research, there has been a greater relative increase in industries with lower research ratios and among the medium and small sized firms.

One example in the attempt to cor-relate research expenditure and the growth of the firm shows that in chemicals five firms out of twenty-two selected which grew fastest in terms of total net assets had a level of internal expenditure on research and development per hundred 21 times as large as the five firms which grew least and a Q.S.E. ratio three times as much.

Nearly one in ten of all, and one in four of large, respondent firms have direct Government research contracts.

On the deficiencies which the survey shows up the most important limitation on expansion of research activity is lack of qualified man power—there is a standing vacancy of about 13 per cent. over all in industry's research and development denartments.

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# INTERIOR TRANSFORMATION OF NOTTS. COUNTY **OFFICES**



Central reception area

WORK is now nearly complete on what amounts to a transformation scheme at Nottinghamshire County Council's offices at West Bridgford. Almost the whole of the temporary interior work has been ripped out and new floors, ceilings and screening have been built in.

The shell of the building, completed in 1947 to the design of Mr. E. Vincent Harris, O.B.E., R.A., was left virtually untouched when staff took possession in 1948; plain and unadorned bricks and mortar with high ceilings were the order of the day.

of the day.

But in 1952, under the direction of the former county architect, Mr. Donald Gibson, C.B.E., work started on demolition of all the temporary floors, ceilings and screening and the reduction of the building to its structural frame.

The task of superimposing a completely new layout of office accommodation, on four floors, then began and has continued under the supervision of the present county

architect, Mr. W. D. Lacey, C.B.E., A.R.I.B.A., A.M.T.P.I.

Four main departments are housed in the building and others, now in Nottingham, will be moved to West Bridgford when an extension scheme, now in the planning stage, is completed. The extension will also provide dining and other amenity accommodation.

The departments in the new building are those of the county clerk, county treasurer, county architect and county education officer, with taxation and licensing sections on the ground floor. Weights and measures, printing, computer and other accommodation is also in the main building.

#### Reception Area

One of the most striking features of the transformation scheme is the way in which a yard, virtually open to the four winds, has been closed in and converted into an attractive reception area. There has been a good use of glass, and double entrance doors have been provided beyond existing colonnades to permit access from the front

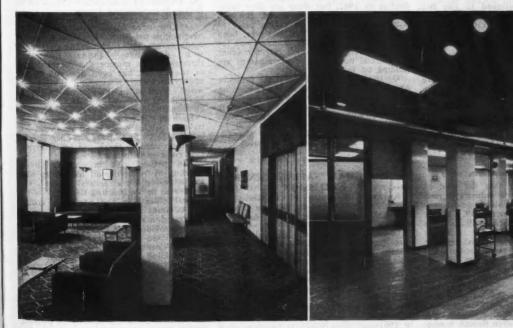
and rear of the building. The original brick and stone floor has been retained but the pillars have been stripped of their stone casing and fitted with substitute light timber facing. A fibrous plaster coffered ceiling with acoustic panels for sound correction has been fitted at intermediate level.

certaing with acoustic panels for sound correction has been fitted at intermediate level.

This central reception area now houses an information desk, telephone switch-board behind glass and curtained screens, treasurer's cash desk, stores, porters' rooms and other accommodation. At the same time, there is room for exhibitions of the councils' and departments' work; as a public relations venture, this is regarded as well worth while.

A main staircase leads from the reception area to the committee and members' accommodation. The council chamber, still in its original condition, is used as a central library, but three committee rooms, a members' writing room and other rooms are available; all open out on to a comfortable members' lounge.

The lounge, which has a picture window (Concluded on next page)



(Left) members' lounge; (right) printing shop

#### WORK STARTS ON £500,000 WEMBLEY STADIUM RECONSTRUCTION

#### Contract Awarded Bovis, Ltd.

WEMBLEY STADIUM is to be reconstructed at a cost of £500,000. The main features of the programme are the erection of an entirely new roof, a new Press gallery, designed to accommodate 250 people, and a television gallery and Eurovision centre.

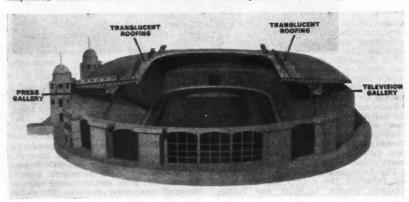
The roof, consisting of 288,000 sq. ft. of aluminium with an inner 36ft. perimeter of translucent fibre glass sheeting, will cover the entire spectator accommodation. Bovis, Ltd., 69 Notting Hill Gate, London, W.II, are the contractors for this section of the scheme, which will cost about £330,000. Work has already commenced.

Press accommodation is to be provided in the form of a steel-framed gallery suspended beneath the roof on the north

side. This gallery will be 300ft. in length, and equipped with lighting, telephones and all other facilities. The television gallery will be sited under the roof on the south side of the arena. Also of steel-framed construction, this balcony will provide the cameras with an uninterrupted view of all events, and will be equipped to accommo-

events, and will be equipped to accommodate the Eurovision link.

Alterations will also be made to the Royal Box and special enclosures. Provision has been made for the installation of 15,000 new tip-up seats in the upper tiers. The Long Bar will be completely modernised, and the corridor bars, toilets and other amenities brought up to date. Sir William Halcrow and Partners, Alliance House, Caxton Street, London, S.W.1, consulting engineers for the scheme, were responsible for the design of the roof.



Sectional model with part of all-round roof removed

# CONSTRUCTION TRENDS IN THIRD QUARTER

#### Beginning of the Downward Slope?

#### From Our Correspondent

FOUR trends are discernible from the Γ various construction industry figures just published in relation to the third quarter of 1961:—

Employment continued to rise but only slightly. It stands at the highest figure since 1956. The rise in output has levelled out, but is over eight per cent. higher

than a year ago.

New orders fell for the second quarter in succession. And for the first time for two years orders were less than the monetary value of the

New commissions to architects (a most sensitive forward indicates most sensitive forward indicator), which have been falling sharply, fell again in the third quarter, but only by one per cent. They were, how-ever, nine per cent. less than a year

#### No Serious Casualties

It seems fairly clear that the load of It seems fairly clear that the load of work on the construction industry is now beginning to fall after a steady and somewhat indigestible rise since 1959. But it seems unlikely that there will be any serious casualties among the different classes of work. Housing is perhaps beginning to take a knock, but the housing pipeline is the fattest of all. Architects' commissions for housing are, however, well down, so that the forward outlook is not bright.

Public investment (excluding local authority housing) seems to be on a rising trend. This is no doubt due to the road programme, unremunerative though it may

programme, unremunerative though it may

be for some of the contractors concerned.

Non-housing work for private developers also shows a reasonably healthy trend. It has been forecast that industrial work will decline in 1962, but there are little signs of it yet in the overall figures, although some slackening may be taking place in certain areas. There has, however, been a sharp fall in architects' commissions for private offices and banks, but for other

private offices and banks, but for other commercial buildings the commissions are holding up reasonably well.

On the whole, it looks as if the pressure on the construction industry is beginning to ease. Nothing alarming has happened yet. The main question perhaps is whether, without the stimulus of high demand, the rise in production will be sustained in the months ahead. Momentarily, the industry seems to have shot its bolt.

BIRMINGHAM SAFETY CENTRE EXTENSION

An extension to the Acocks Green Industrial Safety Centre was recently opened for the Birmingham Industrial Accident Prevention Group.

In welcoming the new extension, the director general of the Royal Society for the Prevention of Accidents, Brig. R. Stone pointed out that among the 2,000 students who had attended courses at Acocks Green in 1961 were 500 apprentices and 150 crane drivers and slingers, nearly double the figures for these categories in the previous year. A total of 250 foremen and supervisors had also attended the centre in 1961.

#### Late Construction News

£1M. Grain Silo. — Piling work is in progress on a site at Belfast Harbour, where a £1m. grain silo is to be built for R. and H. Hall, Ltd., and W. and R. Barnett, Ltd. The consulting engineers are L. G. Mouchel and Partners, London, and the main contractors, McLoughlin and Harvey, Ltd., Belfast. Tenders have been received for pneumatic unloaders and silo handling machinery. The scheme is estimated to be completed by early 1964. WALSALL FLATS CONTRACT. — Subject to Ministry approval, Walsall B.C. have accepted the tender of Sir Alfred McAlpine and Sons, Ltd., Wirrall, Ches, at £338,197, for development at Lower Farm Estate, Bloxwich. The contract covers one six-storey block of 48 flats, eight three-storey blocks of flats, six shops with maisonnettes over, and 79 garages.

Bradford Grammar School. — The tender of F. Shepherd and Son, Ltd., York, at £297,847, has been accepted by Bradford Citv Council, for the erection of the Belle Vue Boys' Grammar School.

£568,186 Housing Tender.—The Housing Committee of Edinburgh City Council have accepted a tender of £568,186 from J. Smart and Co. (Contractors), Ltd., Edinburgh, for 205 houses at Leith Fort Area, Leeds, T.A. Centre.—A contract for the construction of a new T.A. Centre at Skinner Lane, Leeds, has been placed with Cawood, Wharton and Co., Ltd., Southlands, Harrogate. Worth £133,455, the contract was placed by the West Riding Territorial and Auxiliary Forces Association. Plans are by Kitson, Parish, Ledgard and Pyman, Lloyds Bank Chambers, Vicar Lane, Leeds, 1.

SHEFFIELD FACTORY.—George Wimpey and Co., Ltd., London, W.6, have been awarded a £155,000 contract for the erection of a four-storey factory at Napier Street, Sheffield, for Sheffield Twist Drill and Steel Co., Ltd. The architects are Raine and Stacey, 65 Wostenholm Road, Sheffield, 7.
£650,000 Parkinson Contract.—Sir Lindsay Parkinson and Co., Ltd., London, S.E.1, have received a £650,000 contract.

Sheffield, 7.
£650,000 PARKINSON CONTRACT.—Sir
Lindsay Parkinson and Co., Ltd., London,
S.E.1, have received a £650,000 contract
for civil engineering and building work for
the V.L.F. transmitter station at Anthorn,
Cumberland. Work will start shortly and
is due for completion in the summer of
1964. It is to be carried out under the
supervision of the Postmaster-General on
behalf of N.A.T.O.
WANDSWORTH FLATS.— The £94,003

behalf of N.A.T.O.

WANDSWORTH FLATS. — The £94,003 tender of The Anglo-Scottish Construction Co., Ltd., Raynes Park, London, S.W.20, has been accepted by Wandsworth B.C. for the erection of a five-storey block of 30 flats at Wendelsworth Estate.

(Concluded from previous page)
overlooking the River Trent, has a specially
made carpet and a fibrous plaster ceiling
with decorative lighting. Furniture
throughout the members' accommodation,
as the lounge, has been designed by the
county architect in elm and Indian rosewood. Each of the three committee rooms
has lighting over each member's page and

wood. Each of the three committee rooms has lighting over each member's place and air conditioning.

Each of the four main departments has the sown originally designed reception and inquiry desks and sponge rubber flooring has been used in these and other circulation areas to help reduce noise.

The method used in opening up the

The method used in opening up the building by removing all temporary walls and exposing the structural frame is well illustrated in the printing shop, one of the several offices on the open-plan system. The columns in the centre of the room, as illustrated, mark the walls of separate small offices provided under the original scheme. offices provided under the original scheme.
The enclosed area—a typing room—shows the partitioning method in use throughout the building to provide accommodation for section leaders and for special processes

The ceiling in the photograph is experimental and is, in fact, three different types of acoustic materials. The type found to be most satisfactory will be used in the new council buildings, now in the planning stage.

# THE TREATMENT OF INDUSTRIAL AND SEWAGE SLUDGE

# Various Aspects Discussed at London Symposium

In view of the lack of knowledge of the basic principles involved in the important processes of mesophilic anaerobic digestion of sewage sludge and dewatering of it on open beds, the Water Pollution Research Laboratory are carrying out a major programme of investigation concerned with the

of investigation concerned with the dewatering of sludges.
Some of the results recently obtained from this investigation were outlined by J. D. Swanwick, B.Sc., Ph.D., A.R.I.C., K. J. White, B.Sc., and Marian F. Davidson, Water Pollution Research Laboratory, in a Paper "Some Recent Investigations Concerning the Dewatering of Sewage Sludges", which they presented at a symposium on the treatment of industrial and sewage sludges, held in London yesterday by the Metropolitan and Southern Papach of the Institute of Sewage Purifica-Branch of the Institute of Sewage Purifica-

The Paper gave information concerning the specific resistance to filtration of raw and digested sludges from eight sewage works. Laboratory experiments on the digestion of raw sludge from two works with widely differing specific resistances for their respective sludges after digestion at the works were carried out. After steady conditions had been attained both sets of laboratory digesters produced sludges of similar specific resistance. This led to the theory that features of plant design rather than of the nature of the sludge were responsible for differences at the works. Experiments on the shearing effect on the sludge floc of pump impellers gave results indicating that vigorous agitation of sludge results in a deterioration in filtration characteristics, and that, in some cases (perhaps dependent upon sludge commention) pumping of sludge deving The Paper gave information concerning

filtration characteristics, and that, in some cases (perhaps dependent upon sludge composition), pumping of sludge during digestion may be harmful.

The Paper then dealt with experiments on laboratory scale sludge drying beds. Results throw some doubt on the claimed advantages of drying sludge in thinner layers, notwithstanding the quicker drying of a bed, and show that in good drying weather evaporation becomes of major importance in the dewatering of sludge with weather evaporation becomes of major importance in the dewatering of sludge with good drainage characteristics, and is of general importance for sludges with poor drainage characteristics.

It is clear, the paper concluded, that further study of the variables concerned is needed to produce a general understanding of the working of drying beds.

Anaerobic Digestion
In his Paper on "Anaerobic Digestion of Sewage Sludge", S. G. Burgess, Ph.D., B.Sc., F.R.I.C., scientific adviser, London County Council, gave a comprehensive review of the process and dealt with the chemistry and biology of the process. features of plant design, and considerations of operating procedures.

In the decomposition of organic material.

In the decomposition of organic material, arbohydrates are converted, via sugars, to a wide variety of acids, alcohols, aldehydes and ketones. Fats are hydrolised to slycerol and fatty acids and then to simple types, such as acetic acid. Proteins are hydrolised to amino-acids. These degradation products can then be further decom-

tion products can then be further decomposed by the methane producing bacteria. Following information concerning the properties and amount of sludge to be digested, the Paper dealt with the practical considerations of the process.

Temperature control is essential for maximum rate and volume of as production, and 30 deg. to 35 deg. C. are considered optimum temperatures. "Anaerobic digestion". the author stated, "consists of a balanced process in which the rate of acid formation is kept equal to or below the rate of methane formation by maintaining temperature, pH and feed rates near

the optimum for the majority of the methane producing bacteria". The Paper then gives details of the bacteria which have been established as methane pro-

Following consideration of the effect of synthetic detergents on the process, Dr. Burgess commented that a plant operating satisfactorily would be unlikely to be disturbed by surface-active matter, but it might make operation less flexible and

hinder starting-up.

The Paper concluded with assessments of the toxic effect of volatile acids, organic solvents, cyanides, sulphur compounds and metals on the digestion process.

#### Disposal of Sludges on Land

The present position of sludge disposal to land in this country is as follows: 350,000 dry tons per annum supplied as manure, and 280,000 dry tons still available for such purposes. This quantity can be expected to rise as garbage grinders become more common.

become more common.

In his Paper "Disposal of Sludges on Land", A. R. Stone, A.I.Mech.E., manager, City of Nottingham Sewage Works and Farms, said that no claim is made for the trace elements contained in sewage sludge, adding that in the case of Nottingham digested sludge trace elements known to be present are only extracted in minute amounts by the solvents commonly employed in soil analysis.

Dealing with available macro-nutrients.

Dealing with available macro-nutrients, the author gave comparable values of NPK in lb. of nutrient per ton as used of digested sludge and farmyard manure. Translating this into shillings per ton as used, taking actual costs of nutrients in purchased fertilisers, the nutrient worth of digested sludge (assuming no potash) was 13.04s sludge (assuming no potash) was 13.04s. compared with two farmyard manures of 14.28s. and 7.00s. respectively. On the same calculation, the nutrient worth of 10.000 gallons of liquid digested sludge containing 3.5 per cent. total solids was 39.39s., although this made no allowance for the value of ammoniacal nitrogen in the liquid shudge the liquid sludge.

Considering the application of liquid digested sludge to grassland, a single addition of 10,000 gall./acre would supply the necessary N and P<sub>2</sub>O<sub>2</sub> required for general grazing or for hay but a supplement of potash would be necessary. This, the author stated, raises the possibility of supplementing the liquid sludge with potash to make the product even more attractive to farmers.

Sludge has to face severe competition

Sludge has to face severe competition in the manure market due to availability of farmyard manure, organic matter and nutrients from root crops, cereal stubbles and temporary leys, as well as chemical fertilisers, he added. But the increasing emphasis on intensive grassland management offers great opportunities for liquid sludge distribution by tanker wagon, particularly with potash fortification.

#### Chemical Industry's Problems

Experiments with plant scale operation of a centrifuge plant for the removal of solids from a chemical industry effluent (in this particular case, effluent from a plant manufacturing elemental phosphorus) were dealt with by M. E. Chodak, B.Sc., A.M.I.Chem.E., Albright and Wilson (Mfg.). Ltd., in his Paper entitled "Chemical Industry Solids Disposal Problems".

The effluent arises from the water-spraying of furnace gas containing liberated phosphorus vapour after electrically heating a mixture of phosphate rock, silica and anthracite. Some of this water is drawn off the recirculation system for disposal. It is produced at 20,000 galls, hour.

Lime neutralisation followed by vacuum filtration failed to produce consistently

satisfactory results in spite of the use of additional chemical conditioners.
Following successful experimental work with a small-scale Sharples Super-D-Canter, a full effluent treatment plant was installed.
Limed effluent, thoroughly stirred, is passed to a thickener. Sludge is continuously removed from the thickener and fed to the centrifuge; the thickener overflow is discharged to sea. Cake removed from the centrifuge contains 50-55 per cent. solids, and the outflow is recycled. The centrifuge operates with 70-76 per cent. solids removal, and the thickener overflow remains clear of solids.
Considerable evaluation of the plant was carried out and a formula devised for

carried out and a formula devised for determining the rate of sludge withdrawal from the thickener to ensure efficient routine operation.

The author considered that the advan-

tages of centrifuging raw and digested sewage sludge, given as low capital and operating costs, high solids recovery, simple and odour-free operation, are equally applicable to certain processes in the chemical industry where dewatering of sludges is required. of sludges is required.

#### Paper Industry Solids

After reviewing the disposal methods After reviewing the disposal methods for paper industry solids, the special investigations carried out for his group were dealt with by T. Waldmeyer, B.Sc., F.R.I.C., water and effluent chemical engineer, Reed Paper Group, in his Paper on the "Disposal of Solids in the Paper Industry". Industry

Industry".

Details were given of filter pressing and vacuum filtration trials and with centrifuging. A filter press was found to produce cakes of 25-30 per cent. solids at pressures of 80 p.s.i. and pressing times of 1½ to 6 hours. Vacuum filter results varied somewhat, depending upon the nature of fibre in the effluent, but the average solids content of the cake was 20 per cent. Rates of filtration were rather better than for digested sewage sludge. The limited centrifuging trials were less successful, although recent work on successful, although recent work on another type of machine is said to be giving promising results. Lagooning of sludge is the main method used at Aylesford, the main papermaking site, but the efficient and cheap tipping process is dependent upon the limited life of the tip. Experimental work has therefore been

Experimental work has therefore been carried out on the anaerobic digestion of paper mill solids. Digestion proved more effective with older sludge than with "new" sludge. It is proposed to transfer the work to pilot-scale which will allow for studies of the drying of the digested sludge on conventional drying beds.

A possible scheme would be to pump the sludge to a lagoon as at present and later transfer it to a digestion plant of about 30 days detention. The digested sludge would then be discharged to a separate lagoon or to drying beds before removal to tip.

It is probable, the author concluded, that such a process might prove cheaper than mechanical means of dewatering.

#### L.M.B.A. TECHNICAL TEACHERS' MEDAL

The L.M.B.A. Technical Teachers' Medal and a cheque for £25 were last week presented to Mr. Michael Bottomley, M.R.S.H., by the president of the Association, Mr. R. F. Mansell.

Mr. Bottomley, who came highest in the Mark List for the whole country for the Technical Teachers' Examination for the Technical Teachers' Examination for the City and Guilds of London Institute, is at present a full-time teacher of technical subjects at the Matthew Boulton Technical College, Birmingham.

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#### BETTER ROADS COULD AXE ACCIDENT BILL

"HORRIFYING though road acci-dents are in their cost of life and injury their effect on the national economy has also been expertly estimated at £150 million a year," stated Mr. Basil Rogers, Secretary to the Roads Campaign Council, when he addressed a luncheon attended by senior insurance

a luncheon attended by senior insurance executives in London last week.

"The very best method of all for reducing accidents is to improve the roads and a glance at the safety record of the M.1 Motorway underlines this point," he said. "The British driver is rated by many as among the best in the world. Why make his task and his liability to accident all his task and his liability to accident all the greater by inadequate highways?"

The economic cost of accidents is one of the factors which produce a bill of over £500 million a year which is borne by the national economy through traffic conges-

tion.

"This wastage is a very real drain on our national resources affecting our competitive ability in the world markets. The Common Market nations are not building roads for any other reason than that it is good business to do so," Mr. Rogers added. He said that of the £661 million collected in motor taxation in 1961 less than a third was spent on road improvements. Referring to the long delays which are often caused by the lengthy administrative procedure required before major road schemes can be put in hand and which are

known colloquially as "the 31 Steps", Mr. Rogers declared: "The delay caused by the 31 Steps is usually of three years or more and the time is overdue for a full inquiry into the workings of this procedure. "In the face of a doubling of protection."

"In the face of a doubling of motor traffic within the next 20 years only a courageous facing of facts allied with dynamism of thought and speed of action can begin to effect an easing of our traffic thrombosis," he added.

#### APPROVAL FOR CARDIFF **CROWN BUILDING**

The Ministry of Works have received approval for a new Crown building to be built in Cathay's Park, Cardiff. The building will centralise all the head offices of the Government Departments in Wales. Work is due to begin in 1964 and will take about three years. take about three years.

#### NINE-STOREY FLATS BUILT ABOVE TORQUAY CLIFFS

SOMETHING of a triumph over the barriers of natural land formation has been achieved in the construction a nine-storey block of luxury flats which has recently been completed at Kilmorie, Torquay. The block is set in wooded slopes on a hillside above the cliff face and the flats look right down

on to the sea immediately below.

Contours of the site range from 60ft. to 250ft. above sea level. Narrow manade plateaux are cut into the rock of the hillside, and one of these was selected for the nine-storey block, commissioned by Cranleigh Property Dealing Co., Ltd., a member of the property division of Cranleigh Group, Ltd.

leigh Group, Ltd.

After many expert opinions had been taken on the foundations for the site, it was decided to use mass concrete bases to the columns taken down and pegged into the solid rock at various levels up to some 30ft. in depth, using over 1,600 cu yd. of concrete to reach ground level.

There are 54 flats in the block, which has a slow radius curve at the front, with recessed balconies. Living-room and main bedroom in each flat open out on to the balcony, and the balcony cellings are of various colours in contrast to the white exterior of the block.

Balcony units could not be positioned from the front of the building in the normal way, as a crane could not operate on the

from the front of the building in the normal way, as a crane could not operate on the steep slope. The units were pre-cast and wheeled through from the rear of the building to the front on a specially designed frame. Stair units were precast and lifted into position, saving days on the normal method of shuttering.

The flooring pots, 3,400 for each floor, were lifted to floors by a frame which, at one lift, took off a quarter of a lorry load and sections of wall panelling were bolted together and lifted as one panel to avoid dismantling. Prefabricated scaffolding was lifted complete by crane from one position to another. to another.

In each flat plate glass picture windows extend along the full length of the lounge main wall and principal bedroom. Heating is electric underfloor, thermostatically con-trolled and in the lounge-dining-room there is also a built-in electric fire.

The architects for the building were Scott and Clark, Wednesbury, Staffs. The contractors were James Miller and Partners (Hayes), Ltd.

#### T.D.A. COURSES FOR SITE **SUPERVISORS**

THE Timber Development Association announce a series of courses for builders' and contractors' foremen, supervisors and clerks of works. These are to be held on January 23 to 25 (inclusive), March 13 to 15, and May 8 to 10.

The courses will be held at the T.D.A. Training Centre. Tylers Green, Bucks, and

The courses will be held at the T.D.A. Training Centre, Tylers Green, Bucks., and the programme will include lectures on the following subjects: Nature and general properties of timber; principles of commercial grading; mechanical properties and factors affecting strength; structural grading (theory and demonstration); moisture in wood; durability of timber; preservative and fire retardant treatments; painting of wood, its function and problems arising; clear finishes for wood; practical arising; clear finishes for wood; practical aspects of jointing and construction methods; prefabricated components—reduction of site labour; site storage, protection and handling of finished components

Details are available from The Education Secretary, 21 College Hill, London, E.C.4,

#### SHEPHERD GROUP'S ACCIDENT PREVENTION AWARDS

PREVENTION AWARDS

Awards for accident prevention in the annual safety competition held by the Shepherd Group of Companies were presented to winners from York, Hull and Richmond (Yorks) at a recent ceremony.

Announcing the results of the competition, Mr. Donald W. Shepherd, Technical Director, said that the Royal Society for the Prevention of Accidents reported last year that the Shepherd Group were placed 5th. in the Society's record of safety in the construction industries group. In addition, the group had the lowest accident rate in the country in the Society's record for building construction companies with more than 1,000 employees.

#### INDONESIAN HARBOUR CONTRACT

The Republic of Indonesia have placed a £750,000 contract for the construction of harbour facilities at Pontianak, Kaleor narrour facilities at Fontanak, Raignanaton. The contract has been awarded to a group comprising Gammon (Malaya), Ltd., Hawaiian Dredging and Construction Co., Honolulu, and J. H. Pomeroy and Co., Inc., San Fransisco.

(Concluded from page 1001)
outskirts into the centre of the city and
thus provided a two-level road, the lower
acting as a feeder to local streets and
adjoining property, and it was connected to
the skyway by interchange ramps.

It was more general, however, for the
supporting columns or portals to be constructed in reinforced concrete, with the
superstructure supporting the deck slabs
in structural steel. He showed examples,
one being an interchange under construction in the Chicago area, where the
supporting frame was composed of a top
and bottom reinforced concrete spreader
beam which circular columns between and
the whole supporting a bridge structure the whole supporting a bridge structure of steel beams. The other example was an interchange in the San Francisco area,

an interchange in the San Francisco area, the central reinforced concrete columns supporting a balanced cantilever crossbeam on which were supported the structural steel bridge sections.

In the west, around California, it was common practice to design wholly in reinforced and prestressed concrete. He showed an example where the supporting frame of circular columns and header beams supported a reinforced concrete box girder bridge and deck slab. The design was clean and pleasing in appearance and, so far as could be ascertained, economical in construction. in construction.

The same type of box girder design was sometimes supported on single rectangular

columns. A unique feature of this design near San Francisco was the manner in which the columns were positioned to avoid ground obstructions, resulting in their eccentrically supporting the bridge structure. A two-level road, forming part of the interchange, was supported on portal frames which were likewise eccentric in places. Another picture showed part of an interchange near Chicago, consisting of interchange near Chicago, consisting of portal frames supporting concrete beams forming the bridge structure.

#### Conclusion

Bearing in mind the increasing number of people in Britain desirous of owning a motor car and the number of vehicles being produced, he concluded, this country must decide whether it wanted to preserve its picturesque, but nevertheless antiquated, road system and bring the motor vehicle virtually to a standstill, or embark upon a road development plan far exceeding anything it had considered to date.

mything it had considered to date.

Motorways with their interchanges in open country were relatively cheap and easy to provide. Urban expressways, with their attendant multi-level interchanges, were on the other hand expensive and complicated. They were certainly required, and we should, without delay, be taking advantage of the experience of the Americans and benefit from their mistakes, by setting up organisations to master plan by setting up organisations to master plan the designs and making a positive approach

to the problem of finding the vast sums of money that most assuredly would be required. A realistic approach to the average road user would convince him of this need, especially if toll roads were considered.

#### Discussion

Discussion

Mr. T. P. O'Sullivan raised one of the controversial aspects of road layout, that of providing exits from expressways, etc., on both sides. In this country the exits would be from the flow lane off to the left. But he suggested that it would be dangerous to provide exits on both sides, opposite each other, in view of the fast speeds of the cars on the outer lane.

Mr. Scruby said he was not sure that he understood fully what was suggested, but he did not see how we could provide exits on the left and right of a freeway with parallel carriageways.

Mr. W. T. F. Austin commented also on the danger of providing exits on both sides of a highway, but he believed that in the U.S. the motorist could turn left only where special provision was made at intersections.

Mr. Scruby, pointed, out that at one

where special provision.

Mr. Scruby pointed out that at one intersection in the U.S. which he had illustrated, cars which wanted to turn left first turned right on to a ramp, and it was from the ramp that they could turn left and pass under or over the main highway, not directly from the highway.

To be concluded

#### In Parliament

### EFFECT OF REORGANISATION ON LONDON LOCAL GOVERNMENT STAFF

#### Minister Asked for Assurance

FOLLOWING the Government's l acceptance of almost all the main recommendations of the Royal Commission for the reorganisation of local government in Greater London, the Minister of Housing and Local Govern-ment was asked in the Commons last week what action he proposed to take to allay the anxiety of staff in view of the prospective abolition of approximately 60 local authorities.

mately 60 local authorities.

The questioner, Mr. Barter, also requested an assurance that the Government would ensure that there would be opportunities for reasonably comparable employment or adequate compensation.

Replying, Dr. Charles Hill said that no doubt the staff required by the new authorities to be created in Greater London would be recruited very largely from persons already serving local government in that area. He recognised, however, that there would be considerable disturbance and difficult adjustments for some staff, although the reorganisation would also create new opportunities for service. create new opportunities for service.

The Government were studying the whole question. The legislation which would be introduced to give effect to the changes in organisation would certainly contain provision for compensation in respect of loss of employment or reduction pay arising from the changes.

#### Construction Industries (Operatives)

The Minister of Works, Lord John Hope, replying to Mr. MacColl said that about 1,104,000 operatives were employed by the construction industries in October, 1960, and about 1,121,000 in October, 1961. Of and about 121,000 were employed on new house building in both years. On repair and maintenance about 349,000 were employed in 1960, and 339,000 in 1961. Separate figures were not available for commercial building.

#### Private Building

Mr. Lipton asked the Minister of Housing and Local Government if he would take steps to collect and publish statistics showing how much new housing accommodation to rent was being provided by private builders.

Dr. Hill: No Sir.

Dr. Hill: No Sir.
Mr. Lipton: Did not the Government promise that, as a result of their housing policies, more private builders would build more houses to let?
Dr. Hill: The Rent Act had many objectives, including the conversion of large houses into flats, the improvement of property and better maintenance and repair. Those objectives have been achieved. It is a little odd that this complaint of too little housing to rent should come from a party which has done its best to discourage it by promising to repeal the Rent Act should it ever get back to power. back to power.

Mr. M. Stewart: Since Government policy relies more and more on private building and discourages council building, ought not the Minister to be willing to obtain some sort of information as to the

extent to which private building is meeting the need for accommodation to let?

Dr. Hill: Every house, whether built by a local authority or a private builder, makes a contribution to the housing accommodation of the country.

#### **Building Regulations**

Questioned by Sir W. Bromley-Davenport, the Minister of Housing and Local Government said that he was required by the Public Health Act, 1961, to appoint a Building Regulations Advisory Committee, and before making regulations to consult the committee and other bodies representative of the interests. other bodies representative of the interests concerned. He intended to give professional and trade bodies an opportunity of commenting on the regulations in draft.

#### Pulverised Fuel Ash

The Minister of Works, Lord John Hope, informed Mr. Pentland that pulverised fuel ash was sold by the Central Electricity Generating Board to producers of bricks, lightweight aggregates and lightweight con-crete, and also to building and civil engineering contractors for use as aggregate. These uses were increasing. Government Departments who placed building and civil engineering contracts specified the use of materials made from fly ash when appropriate.

#### Factory Inspectorate

In a written answer, the Minister of Labour, Mr. John Hare, told Mr. R. Carr that a thorough review of the organisation and establishment of H.M. Factory Inspectorate had been carried out.

He was satisfied that some increase in the size of the General Inspectorate was row justified particularly having agard

the size of the General Inspectorate was now justified, particularly having regard to the position of the construction industries. He would also strengthen the specialist section at headquarters which dealt with building and civil engineering. The total effect of these changes would be an addition to the establishment of 34 inspectors and 60 other staff.

#### "WHERE ARE THE MOTORWAYS?"

Exactly three years ago this month the eight-and-a-half miles by-pass around Preseight-and-a-half miles by-pass around Preston, in Lancashire, was opened. Britain's motorway building programme had begun. How many more motorway miles have been opened since then? At the end of October, there were just under 150—an average of 50 miles a year.

The national motorway picture as it is now, is given in the fourth of the British Road Federation's series of progress charts, "Where are the Motorways?" This illustrates the position at the end of October 1961 and is based on a statement by the Minister of Transport.

The chart shows that 1484 miles are open to traffic. A further 146 are under con-

to traffic. A further 146 are under construction. However, there are still 375 miles for which no lines have been proposed.

(Concluded from page 1004)

lay the bricks—it can only deliver them to the craftsmen. The rate of progress is therefore dependent on the number of bricklayers and their output. If sufficient bricklayers can be concentrated within the bricklayers can be concentrated within the reach or working area of a crane to make good use of its lifting capacity and the crane can help in speeding up other operations such as floors, roofs, etc., then there may be an advantage in using one. But in this case and, indeed, in all types of construction, if a builder has no previous experience of building with a crane, the only way he can determine whether the use of a crane will be an advantage is to make estimates of the labour force and building time that will be required when materials are handled by crane as well as by other methods.

materiais are nandled by crane as well as by other methods. One of the best ways of making esti-mates of this sort is to draw up production programmes for the contract in question. This technique is very useful for deter-mining the most efficient way to tackle any ich

Unfortunately we have no time to go into the details of programming, but the principles are dealt with in Building Research Station Digest No. 91—first series.

one point about drawing up a programme—it is wise to allow a sufficient margin of time between each operation demanding the services of the crane. If this is not done, and an operation takes longer than planned, the start of the next operation is delayed and the whole programme of work may be disturbed. The

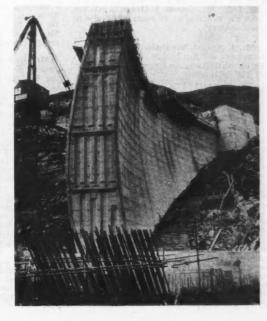
gramme of work may be disturbed. The effect of allowing margins of time between operations will mean that the crane has some idle periods, but this can be far less costly than idle periods for the gangs of men in successive operations.

In conclusion I should like to say that a large part of the work in building is handling materials and a tower crane can be a very efficient machine for this purpose. Success in their application depends upon whether the work can be organised to take advantage of their high potential capacity and to reduce the building time without a disproportionate increase in the labour force. Even if there is no saving in direct cost, but only in time—this is a very valucost, but only in time—this is a very valu-able asset to a builder.

GOOD OOD progress is being maintained on the building of the North of Scotland Hydro-Electric Board's Strath-farrar - Kilmorack hydro-electric scheme near Beauly in inverness-shire. The work involves the construction of the Deanie tunnel, the Monar dam and the Culligran tunnel and ower station.

This picture shows the main Inis picture shows the main dam under construction by the Mitchell Construction Co., ltd., of Peterborough, at Loch Monar in Strathfarrar. A subsidiary dam across a saddle to the west of this dam is also being built.

When completed, the scheme, costing about £41m., will produce annually 28,000,000 units of electricity from a catchment area of 350 square miles in the counties of Inverness and Ross and Cromarty.



# Men and Movements

THE appointment of Mr. W. Atkinson Adam, M.I.Mech.E., as managing director of the three British divisions of The Yale and Towne Manufacturing Co., has been annunced

been announced by Yale and Towne Inter-national, Inc. He succeeds Mr. John T. McCarley, who has been appointed director of manufacturing the international operations of Yale and Towne with headquarters in New York. Mr. Adam gained his early practical training at several



W. A. ADAM

British engineering firms and then became British engineering firms and then became chief engineer with John Summers and Sons, Ltd., for their works in Argentina, The Anglo-Argentine Iron Co., at Buenos Aires. In 1951 he joined the Scottish engineering group of G. and J. Weir, Ltd., as managing director of its French, and later, Belgian and Dutch companies. In 1959 Mr. Adam set up a new engineering, marketing and maufacturing business in Holland in association with Dutch interests—Adam-Hodge N.V. In order to accept the Yale and Towne appointment, he has resigned his executive responsibilities with this company, but will continue to serve on the board. on the board.

Turner and Newall, Ltd., have announced the appointment as consultant architect of Mr. E. D. Jefferiss Mathews, O.B.E., F.R.I.B.A., A.R.I.C.S. Mr. Jefferiss Mathews will advise the company on all matters relating to design and application of products for use in the building industry. industry.

Mr. W. H. Spiers has been appointed manager of the London office of Cater-pillar Tractor Co., Ltd. As part of his new responsibilities he will work closely with Government Departments and with international contracting companies. Mr.



W. H. SPIERS

W. F. LAMB

Spiers joined Caterpillar recently after 13 years' with the Sime Darby Group of companies, one of Caterpillar's dealers in the Far East. During that time he worked in Singapore, Malaya and Borneo. He has been a director of Sime Darby for three years and was manager of their Tractor Division between 1950 and 1959. Other appointments announced by Caterpillar are those of Mr. W. F. Lamb and Mr. G. W. Bryden. Mr. Lamb, who joined Caterpillar in 1958 and has been Caterpillar Special Representative in London since June 1960, becomes district representative working Representative in London since June 1960, becomes district representative working with Caterpillar dealers in Scotland and Ireland. Mr. Bryden's new position is district representative in India, Pakistan and Ceylon. He joined Caterpillar Tractor Co., Ltd., in 1957 as a sales engineer and has been district representative for Scotland and Ireland since last year.

Mr. J. Valentine, who has been company secretary since 1946, has been appointed a director of Andersons Insulation Co., Ltd. The manager of the Belfast branch, Mr. F. S. Page, has been appointed general manager of Andersons and he is succeeded at Belfast by Mr. H. Magee, previously assistant manager. assistant manager.

The new northern area manager at Manchester of Cape Insulation and Asbestos Products, Ltd., subsidiary of The Cape Asbestos Co., Ltd., is Mr. J. A. Fitzpatrick. He succeeds Mr. J. F. Callaghan who retired after 41 years' with Cape Asbestos

some time in the works and on outside installations and in the draw-ing office. He subsequently joined the sales side and from 1936 to 1939 travelled abroad for the company. Rejoining the com-pany after the war, progressively became contracts



C. T. ALDERSON

manager, com-mercial manager in 1953, commercial director in 1957, assistant managing director and deputy managing director earlier this year.

The appointment is announced of Mr. Hedley Gardiner as contracting department manager of Arco Rewinds. Mr. Gardiner will be responsible for providing plans and drawings for the complete wiring installation of new factories and buildings.

Hayters (Sales), Ltd., have announced the appointment of Mr. Kenneth F. Hutchings as their resident representative for the west of England and Wales. Mr. Hutchings was previously a representative in the central east area with Landmaster, Ltd.

Mr. Cleveland lliffe and Mr. T. Dudley Bett are to become directors of En-Tout-Cas, Ltd. Mr. George J. Heggs is retiring from the board after 49 years' service with the company.

Mr. J. Arnold Needham, who joined the company in April, has succeeded Mr. Frank Nattrass as technical sales engineer

of the soils com-paction division of Armstrong Whit-worth (Metal worth (Metal Industries), Ltd.
Mr. Needham served as an apprentice engineer with the Mirrless Group and was subsequently works manager of a company manufacturing mechanical mechanical handling equip-ment. He worked for some 10 years in the earth-



J. A. NEEDHAM

in the earthmoving equipment industry before joining Armstrong Whitworth in April, 1961. Mr. Nattrass, who is taking up another appointment, has been concerned with the introduction into this country of A.W/Albaret pneumatic-tyred soil compactors.

Mr. F. J. Everest, M.Sc., M.I.Mech.E., has been appointed managing director of Vickers Sperry Rand Ltd. (formerly Stein Atkinson Vickers Hydraulics, Ltd.). Mr. Everest succeeds Mr. C. H. Williams who has resigned from this office. Mr. Williams remains as chairman of the board.

Shawnee Poole, Ltd., have announced the appointment of Mr.
J. A. Chapman as district represen-tative for the Southern area. Mr. Chapman is a member of the Institute of British Engineers and has been in the contracting industry for 11 years holding the position of agent.
Prior to joining
Shawnee Poole he
was contracts



J. A. CHAPMAN

manager to a firm of civil engineering contractors.

Mr. William W. Munns, assistant managing director of Roads Reconstruc-tion, Ltd, is to become joint managing

Mr. J. H. Fisher, has been elected president of the Newcastle upon Tyne district of the Building Trade Employers' Association. He succeeds Mr. J. B. Shield.

#### MUNICIPAL

Basingstoke B.C. have appointed Mr. R. Steel, B.Sc., as director of town development, and he will begin his duties on January I. Mr. Steel is at present undersecretary of the Royal Institution of Chartered Surveyors.

Oxford City Council have been recom-mended to appoint Mr. Aneurin John, at present architect and planning officer to the Isle of Man, as deputy city architect.

Mr. W. C. Gibbs, senior divisional surveyor for the eastern division of Suffolk C.C., is retiring shortly after 31½ years with the department.

The engineer and manager of the newly formed South Cumberland Water Board will be Mr. D, S. Henderson, at present deputy engineer and manager at Hudders-

Mr. E. Williams, deputy county surveyor to the Isle of Ely C.C. since 1958, is leaving at the end of the year to take up a position in the Ministry of Transport's divisional road engineer's office at Cardiff. He will be succeeded in the Isle of Ely by Mr. T. G. Brierley, at present a chief assistant engineer with East Riding C.C.

Mr. J. B. Rodger is retiring from the post of divisional surveyor at Ascot, under the Berkshire C.C., a post which he has held for nearly 20 years. For eight years previously he was also on the staff of the department. Mr. Rodger is being succeeded by Mr. O. Evans, who was previously divisional surveyor at Thatcham.

The new engineer and surveyor to Colkham (Berks) R.D.C. is Mr. Gerald Plastow, previously engineer and surveyor to Wolverton (Bucks) U.D.C. He succeeds

Succeeding Mr. J. R. Johnson as engineer and surveyor to Oswaldtwistle (Lancs) U.D.C. will be Mr. J. F. Allison, who at present holds a similar position at Johnstone, Renfrewshire. Mr. Johnson will take up a post at Leek at the end of the year.

The deputy borough engineer and surveyor at Aberystwyth, Mr. Wilfred Roberts, has been appointed deputy borough engineer and surveyor at Colwyn

### RECONSTRUCTION OF EUSTON UNDERGROUND STATION

Work Starts on £700,000 Scheme

EUSTON Underground Station is to be reconstructed to provide a new sub-surface ticket hall, four flights of twin escalators, and new interchange subways. These will replace the exist-ing corridor ticket hall and the three 50-year old lifts. At a later date platforms of the proposed Victoria tube line will be incorporated.

The first stage of the scheme will cost about £700,000, and work has recently started on the initial contract, worth £186,000. This has been let to John Cochrane and Sons, Ltd., and covers excavation of the escalator tunnels and passages. Further stages which are planned for a later date in connection with reconstructions.

ion of the Main Line terminus or building of the Victoria Line, will see the completion of the booking hall, the installation of the remaining flights of escalators, and the construction of passageways to serve the City branch. There will also be inter-change at low level with the Charing Cross

#### Northbound Line Diversion

lg

Northbound Line Diversion

An interesting feature of this part of the scheme will be the diversion of the present northbound City line in a new tunnel to allow the platforms of the proposed Victoria Line to be built in between the two City branch tunnels. This will give easy cross-platform interchange between the two lines and will mean that the north- and south-bound City services will have their own platforms instead of sharing an island platform as now.

Gas mains, electricity and Post Office cables, and drainage have already been diverted, and a working shaft will shortly be sunk in the middle of Drummond Street to enable engineers to construct the escala-

to enable engineers to construct the escala-tor shaft and subway for the Charing Cross branch. Work on the new Underground ticket hall will start later when British Railways' plans for the rebuilding of Euston

Railways' plans for the rebuilding of Euston
Main Line station are more advanced.
One of the escalator shafts will pass under the present site of the Doric Arch
which is being pulled down in preparation
for the Main Line scheme.

The target date for finishing the first
stage is mid-1964. Then, for a time,
there will be two separate entrances to

the Underground station at Euston.

first will serve the Charing Cross branch and the second, comprising the existing booking office and lifts, will continue to serve the City branch until the further stages are completed. Passengers however, still be able to interchange below ground between the City and Charing Cross platforms.

The consulting engineers are Mott, Hay and Anderson.

# SOUTH AFRICAN BUILDING PLANS DECLINE

From Johannesburg, Barclays Bank D.C.O. report that the value of building plans passed in the 51 principal towns of South Africa during September was R9.2 million. This represents a decrease of R4.3 million from the comparable figure for last year.

for last year.

A provincial breakdown of these statistics shows that the decline was of a national nature, with the largest drop recorded in the Transvaal where plans to the value of a little under R4.0 million were approved this year; this figure was some R3.3 million less than the September, 1960, total. The most noticeable decrease in the Transvaal was in the value of flat plans.

total. The most noticeable decrease in the Transvaal was in the value of flat plans. In the Cape, add the Bank, plans to the value of R2.5 million were approved—representing a decrease of 38½ per cent., mainly reflected in the programme for dwellings other than flats. Projects in Natal were valued at R1.6 million (down R640,000) and in the Orange Free State R1.1 million (down R129,000) despite a substantial rise in the programme for public building plans.

#### £8M. BELFAST REFINERY Preliminary Contracts Placed

The British Petroleum Co., Ltd., have placed two contracts in connection with the preliminary work on their £8m. oil refinery to be erected in Belfast, Northern Ireland. West's Piling and Construction, Ltd., Bath Road, Harmondsworth, Middx., are the contractors for the piling work, and Irish Roads (Belfast), Ltd., 23 Sydenham Road, Belfast, will carry out the site-works. Work on this stage of the project will commence shortly.

#### HOUSES BUILT FROM NEW MATERIAL

TWO prototype dwellings built from the new lightweight Siporex material have been completed at Gracemount, Edinburgh, for the City Corporation.

Structurally, the houses are entirely of Structurally, the houses are entirely of Siporex from the ground floor level upwards—external and partition walls, floors and roofs being constructed in different forms of the material. The two dwellings are within a single block, one containing three bedrooms and built on two floors, the other being a two-bedroom flat. Both have a living-room, kitchen, bathroom and the usual storage accommodation. modation.

modation.

Above damp course level, the external walls are 8in. thick solid Siporex-replacing 11in. brick cavity wall commonly used in this country. Partition walls are of 4in, thick blocks. The first floor is supported on the 8in. external walls and is constructed in 7in. thick reinforced Siporex units 2ft. wide, spanning the full 18ft. width of the house. The upper external walls which in turn support the roof are constructed in 8in. thick storeyhigh reinforced slabs. The roof units are 7in. thick and reinforced. 7in. thick and reinforced.

#### 2ft. Module Design

The Siporex units are made in widths of 2ft. and the houses have been designed on a 2ft. module. Externally the treatment for all block work is a two-coat rendering, using Nobel plastic cement, finished with

using Nobel plastic cement, finished with drydash; the slab work is not rendered in this fashion, but is finished with a spray coat of Sicrol "U," a proprietary finish for the external surfaces of Siporex slabs. Internally block work is plastered with one coat only of Nobel dual lightweight plaster instead of the traditional three-coat work. The internal finish on the slab work is either a skim-coat or Nobel dual lightweight plaster or the surface is left untreated for painting or papering.

The roof units are laid to fall to concealed gutters and the three-laver bitu-

The roof units are laid to fall to concealed gutters and the three-layer bituminous felt roofing adhered direct to the Siporex. The need to lay screeds to obtain necessary falls and to create insulation is eliminated. Furthermore no plaster finish is required on the underside, these surfaces being merely painted and the chamfered joints of the slab units being left to form an architectural feature to the ceiling.

Siporex is made by Costain Concrete Co., Ltd. Newarthill, Lanarks.

#### £105,823 CONTRACT FOR A.5 WIDENING

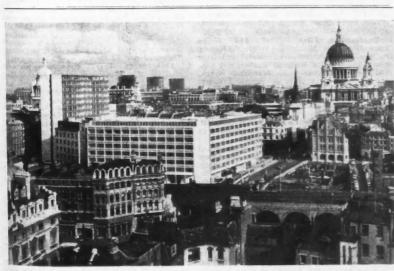
As part of the comprehensive improve-ment of trunk road A.5, a contract for the widening of 1½ miles of this route between Witherley, near Atherstone, and the Royal Red Gate Hotel in Warwickshire, has been let to Broderick and Ryan, Ltd., Notting-ham Road, Ilkeston, at a figure of £105,823. The new carriageway width will be 33ft. Work should be completed within about

six months.

The section now to be improved will link with a proposed by-pass for Ather-

The widening scheme has been prepared for the Ministry of Transport by Warwickshire County Council (county surveyor Mr. David Watson, M.I.C.E.).

Talking of Safety, by "Dragee" appears on page 1030. Subsequent articles include Wates Begin 11-storey Kensington Dwellings (p.1031); 75ft. Span Travelling Gantry Aids Oxford Bridge Construction (p.1032); Resurfacing of Goodwood Motor Racing Circuit Completed (p.1033); Training Courses in Concrete (p.1034); Trade and Company News commences on page 1035.



An addition to the City of London skyline, scen here between Old Bailey and St. Paul's, is the 180ft. high 12-storey tower of Hillgate House, nearing completion by Myton, Ltd., on Ludgate Hill. The £1½m. Hillgate House project, being built for City and Central Investments, Ltd., consists of three office blocks in all (with a floor area of 250,000 sq. ft.), together with 16 shops, three public houses, a restaurant and underground parking for 160 cars. The architect, Mr. Theo. Birks, A.R.I.B.A.

# Gurrent **Constructional** Activities

#### **PROJECTS** CONTRACTS A WARDS

THIS editorial feature provides readers THIS editorial feature provides readers with a comprehensive news service covering forthcoming private and public construction work. Commencing on this page information is given concerning future projects followed by details of tenders being invited. In the third section will be found news of tenders recommended for accentance tenders accented and confor acceptance, tenders accepted and contracts awarded. Attention is also drawn to the advertisements covering contracts and appointments appearing in the front part of the *Journal*.

# BUILDING AND DECORATING (See also Housing Schemes)

(See also Housing Schemes)

Aylesbury, Bucks.— B.C. recommended to approve, subject to conditions, outline plans for the erection of an industrial building at Stocklake for Aron Meters, Ltd.

Barnsley, Yorks.—B.C. recommended to include in the 1962-63 programme, scheme for the restoration of Cannon Hall. Estimated cost £3,993.

Barnsley, Yorks.— Sheffield Regional Hospital Board recommended to appoint Hadfield, Cawkwell and Davidson, 17 Broomgrove Road, Sheffield, 10, architects for provision of central linen room and fouled sluicing point, sewing room and office at Mount Vernon Hospital.

Beddington and Wallington, Surrey.—B.C.

room and office at Mount Vernon Hospital.

Beddington and Wallington, Surrey.—B.C. recommended to appoint W. F. Fidgen and Son, 28 Eccleston Square, London, S.W.l, as quantity surveyors and R. T. James and Partners, 6 Lower Grosvenor Place, London, S.W.l, as consulting engineers for the extension of the central library; prepare bills of quantity and subject to Ministry approval and grant aid, invite tenders for the provision of wash-basins in 210 houses and deep sinks in 155, estimated cost £5,229.

Bedlington, Northumb.—U.D.C. in conjunc-

155, estimated cost £5,229.

Bedlington, Northumb.—U.D.C. in conjunction with the County Planning Officer have prepared a shopping development scheme for the centre of Bedlington. The plan provides for 74 shop units at the initial stage, and 12 smaller shops. Provision will also be made for large multiple stores and there will be parking accommodation for 530 cars.

Best in the Planning appropriation principle.

parking accommodation for 530 cars,

Birmingham.—Planning approval in principle has been granted for development of site on Inner Ring Road, Snow Hill, to provide a 27-storey hotel, shops, offices and an eightstorey car park for 700 cars for Birmingham California Developments, Ltd. Work is expected to commence in about six months' time. Architects for the scheme are Nicholson and Rushton, 2 New Square, Lincoln's Inn, London, W.C.2. Estimated cost £2½m.

Blackburn, Lanes.—E.C. have approved in principle extensions to St. Peter's C.E. Boys' Secondary School.

Blackburn, Lanes.—B.C. recommended to

Secondary School.

Blackburn, Lancs. — B.C. recommended to apply for sanction to borrow £28,881 for the erection of an intermediate reception/short stay home at Shadsworh Road.

Blackpool, Lancs.—B.C. have approved expenditure of £14,020 for Anchorsholme branch library and £9,625 for additional dressing-room accommodation at Stanley Park.

Braughing, Herts.—R.D.C. have approved in principle plans for improvements to 12 houses at Lincoln Hill, Anstey. Estimated cost £12,000. R.D.C. are to proceed with scheme for repairs and improvements to 1-6 Red Brick Cottages, Little Hadham. Estimated cost

£1.695.

R.D.C. are to consider plans for the provision of garages at the following sites: The Pyghtle, Buntingford (9) Cottered (25) and Willow Close, Great Hormead (10).

\*\*Partial City Council recommended to

Bristol. — City Council recommended to approve scheme for a recreation centre for disabled people at Lockleaze. Estimated cost £100,000.

E100,000.
Planning Committee have granted outline planning permission for a combined motel, car park and recreation centre at Prince Street, for Parcars, Ltd. Architects for the scheme are Kenneth Wakeford, Jerram and Harris, 3 Upper Berkeley Place, Bristol, 8. Estimated cost £750,000.

Bury, Lanes.—B.C. have approved scheme for adaptation of Corporation's Athenaeum building to house a Little Theatre and an Adult Education Centre. Estimated cost

Carlisle, Cumb.—The Michelin Tyre Co., Ltd., are seeking a site for new premises on the Willow Holme industrial estate.

Caernarvonshire.—Work is proceeding on plans for the erection of a new maternity clinic in Llandudno, for C.C.

in Llandudno, for C.C.

Cardiff.—Ministry of Works have received approval for the erection of a new crown building at Cathay's Park, to bring under one roof all the head offices of Government departments in Wales. These are now scattered among various buildings in Cardiff. Building, due to begin in 1964, will take about three years.

Cheltenham, Glos.—R.D.C. have approved plans for alterations to exterior of the council offices in Imperial Square. Estimated cost

esterfield. Chesterfield, Derbys.—Sheffield Regional Hospital Board recommended to appoint Glossop, Brayshaw and Bailey, 44 Gluman Gate, Chesterfield, architects for improvements to operating theatre and ancillary accommodation at Scarsdale Hospital; A. E. Thornton-Firkin and Partners, Vauxhall House, Beetwell Street, Chesterfield, quantity surveyors for psychiatric unit and Glossop, Brayshaw and Bailey, 44 Gluman Gate, architects for additional dining/dayroom accommodation in Barwise ward at Walton Hospital. Derbys. - Sheffield Regional

dining/dayroom accommodation in Barwise ward at Walton Hospital.

Consett, Dur. — U.D.C. have approved in principle conversion of St. Aidan's Church Hall, Blackhill, into a community centre. Estimated cost £2,000.

Darlington, Dur. — Plans are being prepared by D. Brown, 10 Lambton Road, Jesmond, Newcastle upon Tyne, for the erection of a parochial hall for St. Anne's R.C. Church; Hepworth, Ltd., Claypit Lane, Leeds, are planning the erection of a shopping block at Prebend Row, and plans have been prepared by the firm's own architect (L. W. Harker); Goddard and Smith, 22 King Street, St. James's, London, S.W.1, have prepared a scheme for the erection of new buildings on the site of the Gaumont Cinema; The District Bank, Ltd., Spring Gardens, Manchester, 2, are to erect new premises at Blackwellgate. Plans have been prepared by H. R. A. Campion-Smith of the firm's Estates Department.

ment.

Derby.—B.C. have appointed C. D. Pilcher, of Graves, Son and Pilcher, 51 Old Steyne, Brighton, 1, as consultant surveyor for the central development scheme.

Derby.—Sheffield Regional Hospital Board recommended to appoint Naylor, Sale and Widdows, St. Mary's Gate, Derby, architects for sluicing accommodation at Worksworth Maternity Hospital

Derby.—Sheffield Regional Hospital Board recommended to appoint Naylor, Sale and Widdows, St. Mary's Gate, Derby, architects for sluicing accommodation at Worksworth Maternity Hospital.

Doncaster, Yorks.—Sheffield Regional Hospital Board recommended to appoint Morrison and Partners, 15 Northumberland Road, Sheffield, 10, architects for conversion of scarlet fever block for chronic sick patients at Tickhill Road Hospital.

Dunfermline, Fifes.—Jeltek, Ltd., Green Lane, Hounslow, Middx., are to erect a factory on the Halbeath industrial estate, estimated cost £90,000; The National Carbonising Co., Ltd., 14 Woodhouse Road, Mansfield, Notts., are to construct a plant at Comrie Colliery, near Dunfermline.

Edinburgh.—The South-Eastern Scotland Regional Hospital Board, 11 Drumsheugh Gardens, Edinburgh, 3, have recommended a development programme at Liberton Hospital. The scheme is for 150 beds to be provided in two phases. Estimated cost £460,000.

Edmonton, Middx.—Co. E.C. recommended to approve the adaptation of the woodwork room at the Higher Grade Secondary School. Estimated cost £890.

Epsom and Ewell, Surrey.—B.C. recommended to approve scheme and invite tenders for the replacement of the shelter and modernisation of men's conveniences at Rosebery Park. Estimated cost £1,365.

Essex.—C.C. have included in the 1961-63 building programme scheme for extensions to the Harlow Technical College, Estimated cost £240,000.

Gateshead, Dur.—Arthur and Kirkup, 13 Swinburg Street, and the replacement for the architect for the second and the programme scheme for extensions to the Harlow Technical College, Estimated cost £240,000.

the Harlow Tecnnical College.
£240,000.

Gateshead, Dur. — Arthur and Kirkup, 13
Swinburne Street, are the architects for rebuilding part of the factory of Reed Millican and Co., Ltd., Team Valley Trading Estate, and rebuilding of the Gardeners Arms public house, Bensham Road, for Isaac Tucker and Co. Ltd. House, Bensham Roau, Ro. Co., Ltd. Glasgow.—Western Regional Hospital Board, 351 Sauchiehall Street, Glasgow, C.2, have

received planning permission in principle for two departments to house the new maternity department and the neuro-surgical unit on a seven-acre site adjoining the Glasgow Southern General Hospital, Govan. Estimated cost £lm.

Hartlepool, Dur.— Improvements are proposed to Hartlepool Hospital by Newcastle upon Tyne Hospital Board. The architect is E. W. Chapman, 125 Acklam Road, Thornaby-on-Tees, and the consulting engineer is A. E. Robb, 36 Jesmond Road, Newcastle upon Tyne.

Thornaby on the state of the st

approve, subject to conditions, plans for the erection of 10 factories at Ronald Lyon estate, Ponswood, for Ronald Lyon (Estates) Co., Ltd., Auckland House, New Zealand Avenue, Walton-on-Thames.

Hebburn. Dur.—U.D.C. considering the erection of swimming baths.

Hedon, Yorks. — Ministry have approved B.C.'s application for loan sanction to build public conveniences in Distaff Lane.

Hendon, Middx.—C.C. recommended to negotiate a tender with John Laing (Construction), Ltd., for erection of Mill Hill Youth Centre at Canada Villa. Estimated cost £20,000.

Hendon, Middx.—Co. E.C. recommended to approve scheme for adaptations to the administrative accommodation at the Technical College. Estimated cost £1,550.

Holland.—C.C. have approved in principle the provision of welfare clinic at Woad Farm estate, Boston.

Hornsey, Middx.—B.C. recommended to prepare draft plans and estimates for the modernisation of 160 pre-war council flats.

Hounslow, Middx.—Tenders are to be invited from selected contractors for the erection of a single-storey supermarket and a four-storey office block at Staines Road, for E. Alec Colman Group of Companies, H. Owen Luder, 79 Regency Street, London, S.W.I. are the architects for the scheme. Estimated Huddersfield, Yorks.—B.C. approved expenditure of £20,000 for new musical block at the College of Technology during 1962-63.

Hunstanton, Norfolk.—U.D.C. to submit for planning approval plans for the provision of additional toilet accommodation, showers am laundry room at South Beach lavatories.

Irvine, Ayrs.—James Carrick, Wellington House, 7 Alloway Place, Ayr, is the architect for the redevelopment of the Kirkgate area for the National Trust for Scotland.

Isle of Ely.—E.C. Lave approved scheme for the enlargement of the Manor School, Wilburton.

Kincardineshire.—Co. E.C. have approved revised sketch plans for the erection of the proposed Searcoft Clinic for the City Council. Estimated

Leeds. — Ministry have approved revised sketch plans for the erection of the proposed Searcoft Clinic for the City Council. Estimated cost £31,100.

cost £31,100.

City Council recommended to approve sketch plans for adaptations at Frazer House. Estimated cost £2,200.

Leek, Staffs.—U.D.C. to prepare plans for erection of conveniences in the Market Place

Leicester.—Andrews, Emmerson and Sherlock, 63 Dean Street, London, W.l, are the architects for the erection of an Il-storey block of offices and shops at the Horse Repository site, Charles Street, for Estates Property Investment Co. Contractors not yet appointed but work on the project (of reinforced concrete frame construction) is expected to commence next March. Estimated cost Leicester.—F.C.

E.C. recommended to appro Leicester.

Leicester. — E.C. recommended to approve final plans for a youth wing at Thurnby Lodge Community Centre. Estimated cost £19,172.

Lichfield, Staffs.—City Council to apply for sanction to borrow £1,675 for the erection of 19 pre-cast concrete garages on parking bays in Windmill Close.

Lincoln.—Sheffield Regional Hospital Board recommended to appoint Parker and Roberts, St. Peters Chambers, Lincoln, architects for toilets at St. John's Hospial.

Maidstone, Kent.—B.C. recommended to approve in principle report and sketch plans prepared by Hillier, Parker May and Rowden, surveyors, 77 Grosvenor Street, London, W.I., for the redevelopment of the area bounded by Lower Stone Street, Knightrider Street, Mill Street and Palace Avenue; submit to C.C. for approval, plans for the erection of 16 shops

with 28 dwellings over at the junction of Wallis Avenue East and Penfold Road.

March, I. of E.—U.D.C. recommended to invite tenders in January for improvements to 16 houses at Gaul Road. Estimated cost

Market Harborough, Leics.—U.D.C. have submitted to Eastern Area County Planning Sub-committee for approval plans for five shops forming an island block fronting The

Sub-committee for approval plans for five shops forming an island block fronting The Square.

Melton Mowbray, Leics.—Area Planning Committee have approved in principle the erection of a new magistrates' court, police headquanters houses and a sports ground at Leicester Road opposite to the Wing garage and a secondary school at Scalford Road.

Middlesbrough, Yorks.—Plans have been prepared by Marshall and Tweedy, 36 Blackett Street, Newcastle upon Tyne, for the rebuilding of shop premises in Linthorpe Road and Pelham Street, for London and Northern Properties, Ltd., 5 Benton Terrace, Newcastle upon Tyne; extensions are proposed to printing works at Longlands Road for Jordison and Co., Ltd. The architect is J. G. L. Poulson, 54 Albert Road; Kitching and Co., Halifax Buildings, Exchange Place, are the architects for church, mission and living accommodation in Linthorpe Road, for the Scandinavian Seamen's Mission; redevelopment scheme at the Acklam Cafe, Acklam Road, for Ceres Investments, Ltd., proposed. The architects are S. John Hill and Partners, 2 Whitfield Street, Gloucester.

Milford Haven, Pembs.—Working drawings are well advanced and tenders are expected to be invited before April 1962 for the proposed new grammar school to be erected at west side of the Milford Steynton Road, for C.C. Design and construction is in the hands of Col. Walter Barrett, county architect, and G. Platt, architect-in-charge of project.

Norfolk.—Co. Welfare Committee's programme for 1962-63 includes provision for the first instalments of new county homes at Stalham and Brundall to replace Homelea at Lingwood; hostel at North Walsham and purchase of a site to build premises for the elderly mentally infirm.

Northallerton, Yorks.—A new chapel is proposed at Friarage Hospital, by Newcastle.

lingwood; nostel at North Walsham and purchase of a site to build premises for the elderly mentally infirm.

Northallerton, Yorks.—A new chapel is proposed at Friarage Hospital, by Newcastle Hospital Board. Benfield Road, Newcastle upon Tyne. P. H. Knighton, chief architect. Estimated cost £7,000.

Northampton.—B.C. recommended to approve scheme for a cattle vehicle wash at the Cattle Market. Estimated cost £15,000.

North Walsham, Norfolk.—U.D.C. recommended to submit to Ministry for approval, scheme for modernising 44 pre-war old people's bungalows. Estimated cost £8,360.

Norwich.—Bills of quantities are being prepared for the erection of a five-storey office block with car parking facilities on ground floor at 102-106 Prince of Wales Road, for the Eagle Star Insurance Co., Ltd. T. and P. H. Braddock are the architects and H. D. Ide, the quantity surveyor, both at 14 Great Smith Street, London, S.W.1. Estimated cost £60,000.

Nottingham.—Sheffield Regional Hospital

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Nottingham.—Sheffield Regional Hospital Board recommended to appoint Hedley B. Marshall, King Johns Chambers, Bridlesmith Gate, Nottingham, architects for additional provision of linen store at Mapperley Hospital; and Cartwright, Woollatt and Partners, of Clarendon Street, Nottingham, architects for builder's work for provision of three new lifts at General Hospital.

Nuneaton, War.—C.C. recommended to approve scheme for alterations to kitchen and scullery and installation of heating system at Attleborough Grange old people's home, Estimated cost £6,200.

Co. Fire Brigade to erect a four-bay fire Nottingham. - Sheffield Regional Hospital

mated cost £6,200.

Co. Fire Brigade to erect a four-bay fire station with divisional headquarters. Estimated cost £75,000.

Omagh, Tyrone.—R. H. Beck, 6 Market Street, Omagh, has prepared plans for an abattoir and meat processing factory of 10,000 sq. ft. at Doogary. Estimated cost £50,000.

50,000.

Oswestry, Salop.—R.D.C. have approved has for new council office accommodation, stimated cost £25,000.

Radclifle-on-Trent, Notts.—Sheffield Region-Hospital Board recommended to appoint health Howitt and Partners, St. Andrews House, oftingham, architects for improvements to toilets and improvements to toilets.

Cecil Howitt and Partners, St. Andrews House, Nottingham, architects for improvements to artisan staff toilets and improvements to toilets in administration block at Saxondale Hospital. Rotherham, Yorks.—Sheffield Regional Hospital Board recommended to appoint Morrison and Partners, 15 Northumberland Road, Sheffield, 10, architects for provision of wash-basins in staff bedrooms at Moorgate General Hospital.

St. Ives, Hunts.—R.D.C. recommended to retet six garages at Needingworth.

st. ives, Hunts.—R.D.C. recommended to effect six garages at Needingworth.
Salisbury, Wilts. — Ministry have approved plan for the reconstruction of three adjoining

properties in High Street, for Bristol and West Building Society, St. Stephens House, Colston Avenue, Bristol, 1.

Salford, Lancs.—Wilfred Thorpe and H. Hirst Smith, architects, 65 Barton Arcade, Deansgate, Manchester, 3, are preparing detailed drawings for erection of new R.S.P.C.A. clinic and centre at Hodge Lane, Nr. Langworthy Road, for the Royal Society for the Prevention of Cruelty to Animals. Estimated cost £7,000 to £8,000.

Scarborough, Yorks.—Borough Engineer to prepare a scheme for new conveniences on a site at junction of St. Sepulchre Street and Friarsgate.

Scunthorpe, Lincs.—Sheffield Regional Hospitad Board recommended to appoint Buttrick and Buttrick, 43 Oswald Road, Scunthorpe, architects for provision of central milk kitchen at Maternity Home.

Sheffield.—Regional Hospital Board recommended to appoint Palah Mat 10 St. Vermended.

Sheffield.—Regional Hospital Board recommended to appoint Ralph Mort, 1 St. James Street, Sheffield, 1, architect for builder's work for central heating extensions at City General Hospital; Hadfield, Cawkwell and Davidson, 17 Bromsgrove Road, Sheffield, 10 architects for improvements to access to boiler house, kitchen, etc., at King Edward VII Hospital and Morrison and Partners, 15 Northumberland Road, Sheffield, 10, architects for chest clinic at Royal Infirmary.

and Morrison and Partners, 15 Northumberland Road, Sheffield, 10, architects for chest clinic at Royal Infirmary.

Sockton-on-Tees, Dur. — Plans approved for extensions to the Yorkshire Bank, High Street and Finkle Street; and new premises in Manfield Street for the Barrington Club.

Stockport, Ches.—Ministry have informed B.C. that approval would not be forthcoming for lowest tender submitted by Tersons, Ltd., in the sum of £459,866 for phase II of extensions at Stockport College of Further Education, and have suggested that the scheme should be postponed for about six months, at which time fresh tenders should be invited.

Sunderland, Dur.—Premises at the junction of Athol Road and Suffolk Street are to be converted into club premises for the Ivy Leaf Club and Institute, Ltd. The architect is J. M. Angus, 3 Gallowgate, Newcastle upon Tyne.

Tyne.

Plans have been prepared by S. W. Milburn and Partners, 9 Esplanade, for reconstructing part of the premises on the Trustee Savings Bank at the junction of Athenaeum Street and John Street; Sunderland and South Shields Water Co., Ltd., John Street, are buying land near High Ford Farm for the erection of store buildings, offices and houses; Megator Pumps and Compressors, Ltd., 43 Berkeley Square, London, W.I. propose factory on one acre site at Sunderland.

Taunton, Som.—B.C. recommended to approve scheme for the construction of a sports pavilion at Priorswood playing field. Estimated cost £7,000.

Tottenham, Middx.—Co. E.C. recommended

cost £7,000.

Tottenham, Middx.—Co. E.C. recommended to approve the adaptation of a room at the Technical College as a building science laboratory. Estimated cost £980.

Twickenham, Middx.—Co. E.C. recommended to approve scheme for the extension and remodelling of the Rectory Secondary School. Estimated cost £180,190.

Wallsend, Northumb.—William Stockdalz, 73 Howard Street, North Shields, is the architect for a proposed church hall at North View, for the Trustees of the Assembly of God.

God.

West Drayton, Middx.—Co. E.C. recommended to approve scheme for the erection of a classroom hut at the primary school. Estimated cost £2,500.

Westwood, Kent.—Thanet Water Board have approved for submission to Ministry, scheme for the erection of central accommodation. Estimated cost £165,000.

Worksop, Notts.—Sheffield Regional Hospital Board recommended to appoint Frith and Taylor, Newcastle Chambers, 45 Carlton Road, Worksop, architects for extension of X-ray room at Victoria-Hospital.

#### ELECTRICAL

Hornsey, Middx.—B.C. recommended to approve scheme and invite tenders in due course for the installation of traffic signals at the junction of Fortis Green/Tetherdown/Queens Avenue/Fortis Green Road.

#### GAS AND WATER SUPPLY

GAS AND WATER SUPPLY

Carlisle, Cumb.—During the next 10 years
the City Council is to spend £500,000 developing the city water supply. Plans will be
prepared by the Corporation's own staff.

Cork.—C.C. propose a regional water supply
scheme at Ballincollig. Estimated cost £285,000.

Hastings, Sussex.—B.C. recommended to
approve the provision of a six-inch asbestos
cement water main at Hillside Road. Estimated cost £1,500.

Hungerford, Berks.—R.D.C. have approved
scheme for the construction of a service reservoir at Bell Lane, Inkpen, for the Thames
Valley Water Board.

Irvinestown, Fermanagh.—R.D.C propose water supply and sewerage schemes during the next five years costing about £325,000.

Leicester.—Sheffield Regional Hospital Board recommended to appoint Pick, Everard, Keay and Gimson, 6 Millstone Lane, Leicester, architects for water storage at Royal Infirmary.

Narborough, Leics.—Sheffield Regional Hospital Board recommended to appoint Pick, Everard, Keay and Gimson, 6 Millstone Lane, Leicester, architects for water softening plant at Carlton Hayes Hospital.

Norwich.—Water Committee to proceed, subject to Ministry approval, with scheme for sinking borehole near junction of Thorpe Road and Harvey Lane. Estimated cost £9,000.

Nottingham.—Sheffield Regional Hospital

Road and Harvey Lane. Estimated cost £9,000.

Nottingham.—Sheffield Regional Hospital Board recommended to appoint Ritchie and Partners, Alton, Kitsbury Road, Berkhamsted, Herts., structural engineers for water storage at Sherwood/Nottingham City Hospital.

Ramsey, Hunts.—Ministry have approved in principle U.D.C.'s scheme for a water tower at Biggin Lane.

Salisbury and Wilton, Wilts.—R.D.C. to proceed with scheme for supplying water on regional basis to Pitton, Winterslow and Lopcombe Corner. Estimated cost £48,435.

Tenbury. Worcs.—R.D.C. to submit to

combe Corner. Estimated cost £48,435.

Tenbury, Worcs.—R.D.C. to submit to Ministry for approval, a piped water supply scheme for the parishes of St. Michaels and Old Wood and The Berringtons. Estimated cost £46,000.

Wiltshire.—West Wiltshire Water Board to apply for sanction to borrow £1,432,600 for the first three phases of the Northern Division Comprehensive Scheme.

#### HARBOURS, PIERS AND SEA DEFENCE WORKS

Blyth, Northumb.—A Ministry inquiry is to be held into the T.C.'s £500,000 scheme for the construction of a sea wall between Blyth and Seaton Sluice.

#### HEATING AND VENTILATING

Chesterfield, Derbys. — Sheffield Regional Hospital Board recommended to appoint Glossop, Brayshaw and Bailey, 44 Glumangate, Chesterfield, architects for boiler plant at Scarsdale Hospital.

Doncaster, Yorks.—Sheffield Regional Hospital Board recommended to appoint Brian Colquhoun and Partners, 18 Upper Grosvenor Street, London, W.I., consulting engineers for mechanical and electrical services at Tickhill Road Hospital and St. Catherine's Hospital.

East Sussex.—C.C. propose the installation of an oil-fired heating plant at the health centre and child guidance clinic, Old Shoreham Road, Portslade.

Lincoln.—Sheffield Regional Hospital Board recommended to appoint Myles-White and Associates, White Hart Chambers, 16 White Hart Street, Mansfield, architects for reorganisation of engineering services at Harmston Hall.

Mexborough. Yorks.—Sheffield Regional

Mexborough, Yorks.—Sheffield Regional Hospital Board recommended to appoint James Totty and Co., Carnson House, Moorate Road, Rotherham, architects for operating theatre ventilation at Montagu Hospital.

Willesden, Middx.—Co. E.C. recommended to approve scheme for the conversion of the heating system to oil firing at Kesal Rise Primary School. Estimated cost £1,150.

#### HOUSING SCHEMES

Ampthill, Beds.—R.D.C. recommended to approve the erection of 93 dwellings during 1962 and 99 during 1963.

Basingstoke, Hants.—Co. Planning Committee have granted outline permission for R.D.C.'s amended scheme for 42 flats, two houses, 10 old people's bungalows and 42 garages at Cavalier Road, Basing.

Batter, Vorks.—B.C. to annly for sanction

houses, 10 old people's bungalows and 42 garages at Cavalier Road, Basing.

Batley, Yorks.—B.C. to apply for sanction to borrow £108,049 for second stage of the Batley Carr redevelopment scheme providing for 49 dwellings, eight shops and eight garages. The buildings will include one block of three-storey two-bedroomed flats with underfloor electric heating.

Blackpool, Lancs.—B.C. have approved spending of £24,530 for houses and outbuildings 24 to 58 East Topping Street, Blackpool, in connection with clearance scheme.

Bridgaorth, Salop.—R.D.C. to proceed with scheme for the provision of flatlets at Alveley and bungalows at Rhea Hall estate, Highley, for old people.

Carlisle, Cumb.—City Council recommended to prepare plans for the erection of one block of 12 two-bedroom flats at Bower Street.

Town planning Committee have approved plans submitted by Oldfield, Simpson and Saul, architects, National Provincial Bank Chambers, Workington, for the erection of 12 houses and 18 bungalows at Hopes Hill Drive, Forest Hill and High Green Croft, for J. Twiname, Ltd.

Chanctonbury, Sussex.—R.D.C. to submit to Ministry for approval, plans for the erection of 28 bed-sitting rooms for aged persons at Briton's Croft, Steyning.
C.C. have approved R.D.C.'s plan for housing and a school site at Fairfield Farm. Browns Lane, Storrington.
Cheltenham, Glos.—Ministry have approved the residential development and vehicular and pedestrian access on land fronting Hyde Lane, Swindon Village, for R. L. Playdon, 48 Roman Road.

Road.

Cuckfield, Sussex.—R.D.C. have approved in principle 1962 housing programme, comprising the erection of 75 units of accommodation.

Darlington, Dur.—C. M. Yuill, Ltd., Villiers Street, West Hartlepool, have bought the Mowden estate, covering 157 acres, for housing developments.

Mowden estate, covering 157 acres, for nousing developments.

Dawiey, Salop. — U.D.C. recommended to instruct James Hickman and Sons, architects, I Market Street, Wellington, to prepare plans and specifications for roads and sewerage contracts for the whole of the Langley Farm Phase 2 housing scheme, and to invite tenders for 37 houses as the initial stage of the scheme.

for 37 houses as the initial stage of the scheme.

Devizes, Wilts.—B.C. plan the erection of 56 houses at Caen Hill estate.

Doncaster. Yorks.—B.C. propose the erection of the following houses: 61 on Cantley estate; 65 at Intake; 10 at Carr House; 10 at Woodfield; and 10 at Wheatley Park.

Downpatrick, Down.—U.D.C. have approved in principle plans for the redevelopment of Briage Street area including 33 houses and 25 flats.

25 flats. Edinburgh. — Robert Hurd, 41 Charlotte Square, Edinburgh, is the architect for the final phase of the Chessel's Court restoration and redevelopment scheme in the Royal Mile for City Council. Estimated cost £125,000. Work is expected to start in the spring. Epsom and Ewell, Surrey. — B.C. recommended to approve draft layout plans for Longmead estate including the erection of 360 dwellings.

Longmead estate including the erection of 360 dwellings.

Hastings, Sussex.—B.C. recommended to approve subject to conditions, outline plans submitted by B. Stevens and Partners, architects, 49 Hevelock Road, Hastings, for the erection of one four-storey block of 16 dats with garage for 16 cars in basement; St. Mary Magdalen Rectory, St. Margaret's Terrace, for G. Stanley.

Huntingdonshire.—Planning Authority have granted, subject to conditions, planning permission for the erection of 96 houses and 73 bungalows with car ports and roads at Coneygree Road, for Davis Estates, 346 Kilburn High Road, London, N.W.6.

Isle of Wight.—Ministry have approved the erection of 20 dwellings for old people during 1962 for R.D.C.

Kingsclere and Whitchurch, Hants.—R.D.C.

erection of 20 dwellings for old people during 1962 for R.D.C.

Kingsclere and Whitchurch, Hants.—R.D.C. have granted planning permission for houses, maisonnettes, three-storey block of flats and garages at Rowan Farm estate and east of Multords Hill, and houses, hree-storey blocks of flats and garages at New Inn estate, Rowan Road, Tadley, for Kelmscot Building Co., Ltd., Rowan Road, Tadley, Council recommended to approve layout plan for development of the Marlborough Street area providing for the erection of a 17-storey block of flats (99 dwellings), 56 five-person four-storey maisonnettes and 155 garages; revised layout plan for development of land at Half Mile Lane providing for the erection of 48 five-person four-storey maisonnettes, 36 two-storey houses and 78 garages and authorise the City Architect to negotiate with G. Wimpey and Co., Ltd., for the erection of the wellings and garages.

City Council recommended to approve the appointment of Felix I Samuely and Partners.

78 garages and authorise the City Architect to negotiate with G. Wimpey and Co., Ltd., for the erection of the dwellings and garages.

City Council recommended to approve the appointment of Felix J. Samuely and Partners, consulting engineers, 231 Gower Street, London, N.W.1, for the design of the foundations for individual blocks in connection with erection of 296 four-storey maisonnettes on the Swinnow, Charing Cross, Kirkstall Hill and Moorville estates.

Leominster and Wigmore, Heres.—Co. Planning Committee have approved R.D.C.'s layout plans for eight houses at Wysone Avenue, Brimfield.

Lindfield, Sussex.—Ministry have approved plans for the erection of 20 dwellings at William Allen Lane, for C. H. Wardroper (Builders), Ltd., 64 Ockley Lane, Hassocks.

Maidstone, Kent.—B.C. recommended to submit to C.C. for approval detailed plans for the erection of 196 dwellings in 22 blocks of two- and four-storeys at Brishing Lane/Wallis Avenue East; approve plans for 57 dwellings and garages at Selby Road/Bicknor Road.

Newcastle upon Tyne.—City Council will invite tenders next spring for the erection of a block of flats and a nursery at Shieldfield. Estimated cost £55,000.

Onchan, I. of M.—Village Commissioners have approved the erection of 12 bungalows at Ballachrink estate.

Peterborough.—R.D.C. have approved revised layout plan for 12 bungalows at Holmes Road, Glinton.

Pwilheli, Caerns.—B.C. to invite tenders from selected contractors for the erection of 115 houses at Morfa Garreg and Ffordd Mela. Ramsey, I. of M.—Planning Committee of Local Government Board have approved, subject to conditions, B.C.'s plans for 16 houses on old Coronation Tennis Courts.

Rotherham, Yorks.—Sheffield Regional Hospital Board recommended to appoint James Totty and Co., Carnson House, Moorgate Road, Rotherham, architects for two flats for medical officers at Rotherham Hospital.

Sandwich, Kent.—B.C. recommended to appoint L. R. Barlow, architect, 32 Milwall Place, Sandwich, to prepare alternative layout plans for the development of Gazen Salts.

Sevenoaks, Kent.—Interpro (Real Estate), Ltd., 38 Atsworth Parade, Queensway, Petts Wood, have submitted to R.D.C. for planning permission, scheme for the erection of approximately 50 houses at the end of Greenview Avenue.

Slough. Bucks.—B.C. have no objection to

Avenue. Slough, Bucks.—B.C. have no objection to C.C.'s scheme for the erection of 32 flats for firemen at the Three Tuns junction, Bath Road, Stockton-on-Tees, Dur. — Plans have been approved for 76 houses at Auckland Way, etc., for Wimpey and Co., Ltd., Cargo Fleet Lane, Middlesbrough; 11 houses at Kilburn Road extension, for the Dinsdale Construction Co., Dinsdale.

Sunderland, Dur.—S. J. Stephenson, Gillis and Partners, Saville Chambers, North Street, Newcastle upon Tyne, have prepared a scheme for the erection of four five-storey blocks of flats, each containing 26 units, on the Bainbridge Haller and the state of the state o

for the erection of the latest that a cach containing 26 units, on the Bainbridge Holme estate.

Upton-on-Severn, Worcs.—R.D.C. propose the erection of 14 houses at Ryall and eight flats at Powick.

#### PLAYING FIELDS, PARKS, ETC.

Blackburn, Lancs.—B.C. recommended to include in the 1962/63 programme, scheme for the levelling and seeding of land at the easterly end of Queen's Park. Estimated cost

B.C. recommended to approve scheme to develop land fronting Gorse Street as a recreation ground. Estimated cost £2,200.

Cuckheld, Sussex.—U.D.C. have approved the reconstruction of two hard tennis courts at Lindfield Common, during 1962-63. Estimated cost £1,248.

Hornsey, Middx.—B.C. recommended to proceed shortly with the laying out of the garden surrounds between the Assembly Hall block and the Glasslyn Road boundary. Estimated cost £1,813.

Mangoisfield, Glos.—U.D.C. recommended to approve in principle, layout plan for

Mangoisfield, Glos. — U.D.C. recommended to approve in principle, layout plan for Bromley Heath playing field, Downend.

Newcastle upon Iyne.—Moor and Parks Committee has approved, in principle, plan to develop and improve its 900-acre Town Moor, one of the best-known open spaces in the country. The scheme is to develop the moor as a great regional open space, and as a regional focal point for social and recreational facilities with particular emphasis on youth, also to provide botanical gardens. Estimated cost £1m.

City Council are planning the conversion of the Ouseburn tip into a park. Estimated cost £50,000.

# RIVER AND FLOOD PREVENTION WORKS

Epsom and Ewell, Surrey.—B.C. recommended to invite tenders for the alleviation of flooding at Treadwell Road, Epsom.

Great Yarmouth, Norfolk.—Land Drainage Committee of the East Suffolk and Norrolk River Board to submit to Ministry for grant aid, three-year scheme for piling the west bank of the River Bure. Estimated cost £15,300.

#### ROADS, BRIDGES AND SITE WORKS

Blackburn, Lancs.—B.C. propose the con-struction of a dual carriageway on the trunk road from Roe Lee to Whalley Old Road by

Direct Labour, Kent.—City Council have approved for inclusion in next year's programme, scheme for the improvement of access road and extension of St. Peter's Lane car park.

Clackmannanshire.—Landward Committee have approved the second phase of the South Pilmuir Road development. Estimated cost

E72,547.

Epsom and Ewell, Surrey.—B.C. recommended to invite tenders for the making-up of Oakdale Road, West Ewell.

Glasgow.—City Council propose improvement to one mile of Carmunnock Road, between Croftfoot Road and High Netherton Farm. Estimated cost £150,000.

Gloucestershire.—Highways Committee have approved trunk road improvements between Cheltenham and Painswick including visibil-

ity improvements at King's Head Cottage, Shurdlington, Adam and Eve Inn, Paradise, and Cranham corner and a lay-by north of the A417 road at Brockworth and two lay-bys at Woodlands Estate, Leckhampton.

Hastings, Sussex.—B.C. recommended to approve scheme for submission to M.T. for grant aid and invite tenders in due course for the improvement of Bourne Road, section 2. Estimated cost £79.978.

Hertford.—B.C. are to include in the 1962-63 programme scheme for the widening and improvement of Hertingfordbury Road, from Cross Lane to Sele Road. Estimated cost £15.000.

£15,000.

Hunstanton, Norfolk.—U.D.C. recommended approve plans for development of the Minna Lodge Garden for use as a central area car park and bus terminus. Estimated cost £10,176.

park and bus terminus. Estimated cost £10,1/6.

Leeds,—M.T. to carry out as agents for the
City Council, the preparation of detailed drawings, plans, etc., for construction of a traffic
roundabout at junction of the Ring Road and

roundabout at junction of the Ring Road and King Lane.

City Council recommended to approve the construction of a dual carriageway in York Road from Foundry Lane to Seacroft by-pass at Barwick Road, and apply to M.T. for a grant towards the estimated cost of £181,000.

City Council recommended to approve scheme for improvement of Tinshill Road, and apply to the M.T. for a grant towards the estimated cost of £73,200; to carry out improvement works to a length of roadway at Knostrop sewage disposal works. Estimated cost £1,000.

Leek, Staffs.—U.D.C. have prepared scheme for provision of car parks at various sites. Estimated cost £15,500.

Maidstone, Kent.—B.C. recommended to

Estimated cost £15,500.

Maidstone, Kent. — B.C. recommended to approve the making-up of North Way and Woodland Way. Estimated cost £1,391 and £1,823 respectively.

Newport, Mon.—B.C. recommended to apply for the control of the con

Woodland Way. Estimated cost £1,391 and £1.823 respectively.

Newport, Mon.—B.C. recommended to apply to M.T. for grant aid and loan sanction for the construction of the six-lane George Street Bridge and approaches between Dock Street and Corporation Road and a four-lane approach road from Cardiff Road, estimated cost £1,538,000; approve plans for the making up of Ridgeway Crescent, Ridgeway Grove and Eveswell Park Road.

Oswestry, Salop.—R.D.C. recommended to approve schemes for improvements to nine housing esetate roads and Church Lane, Knockin and Rock Lane, Kinnerley, Estimated cost £3,500 and £1,900.

Scarborough, Yorks.—B.C. recommended to approve plans for improving Queen's Parade, together with provision of fluorescent electric street lighting. Estimated cost £19,920.

Sheffield.—City Council recommended to approve amended plans for construction of two footways and a carriageway in a proposed underpass to a proposed railway loop line on land at Shepcote Lane.

Somerset.—M.T. have approved the following road improvement schemes for CC:

land at Shepcote Lane.

Somerset.—M.T. have approved the following road improvement schemes, for C.C.: 1962-63. Yeovil through traffic route at Reckleford—east of Wyndham Street to Mary Street; and 1963-64, Mary Street—from Bide's Gardens to join kingston near the junction with Court Ash.

Sunderland, Dur.—B.C. recommended to approve in principle to the provision of a landing strip at the Usworth Airfield, Estimated cost £7,500.

Swansea.—B.C. are to submit to M.T. for loan sanction, scheme for the construction of a roundabout at Cwmbwrla Square and improvement of adjoining roads. Estimated cost £262,750.

Warrington, Lancs.—Highways Committee

COST LADLI, 790.
Warrington, Lancs. — Highways Committee
to spend £30,000 next year on the reconstruction of Hawley's Lane Bridge.

# SEWERAGE, SEWAGE AND REFUSE DISPOSAL

Ashton-under-Lyne, Lancs.—B.C. recommended to include in the 1962-63 programme, sewer reconstruction scheme at Margaret Street, Victoria Street and Grosvenor Street. Stimated cost £35,000.

Basford, Notts.—Nottingham City Council propose the construction of a new sewerage system to serve the Village of Stoke Bardolph. The cost of the scheme will be met by the Basford R.D.C.

Chislehurst and Sidcup, Kent.—R.D.C. have approved following schemes for inclusion in the current estimates: extension of sewer at Bunkers Hill, North Cray; foul water sewer and outfall at Powerscroft Road, Foots Cray; sewers off Leesons Hill, Chislehurst; relief surface water sewer scheme at Old Sidcup West; relief sewer at Adelaide Road and Belmont Lane, Chislehurst, and surface water outfall at Powerscroft Road, Foots Cray.

Evesham, Worcs.—Ministry have approved in principle R.D.C.'s sewerage and sewage disposal scheme for Badsey and district.

Great Yarmouth, Norfolk.—B.C. have included in the 1962-63 programme phase one

Great Yarmouth, Norfolk.—B.C. have included in the 1962-63 programme phase one

and two of the Southtown sewer outfall scheme, Estimated cost £200,000.

Hastings, Sussex.—B.C. recommended to apply for sanction to borrow £57,400 for the construction of stage IV of the Ore Valley main drainage scheme.

Leds.—City Engineer to be authorised to negotiate with Cementation Co., Ltd., for repairs by grouting to a further length of 1,153vd, of Middleton 2 outfall sewer.

Melford, Suffolk.—R.D.C. to submit to Ministry for approval the Stanstead sewerage and sewage disposal scheme. Estimated cost £77,000.

(27,000) Middlesbrough, Yorks.—Corporation Cleansing Committee have approved new scheme for modernising the town's refuse disposal plant. Estimated cost £71,000.

Estimated cost £71,000.

Old Fletton, Hunts.— U.D.C. to instruct (B. Kershaw and Kaufman, consulting engineers, 82 Victoria Street, London, S.W.l, to prepare and submit to Ministry for approvable distinctional sewerage scheme. Estimated cost

88,000.

Reeth, Yorks.—R.D.C. to proceed with a wewerage scheme for Reeth, Fremington and Ginton. The cost will be nearly £15,000.

Salisbury and Wilton, Wilts.—R.D.C. have whitted to Ministry for approval, sewerage cheme for Alderbury. Estimated cost

submitted scheme for Alderbury. Estimated [152,600. Stone, Staffs.—R.D.C. have approved in principle sewerage scheme for Fulford area. Estimated cost £22,325. Stratford-upon-Avon, War.—R.D.C. to apply for sanction to borrow £26,236 for a sewerage scheme for Ullenhall and £63,424 for sewage disposal works at Claverdon.

Thedwastre, Suffolk.—R.D.C. to submit to Ministry for approval, scheme for extending sewer at Walsham-le-Willows to Finningham Pand Estimated cost £4,000.

#### STREET LIGHTING

Barnet, Herts.—U.D.C. have approved scheme for improving the lighting in Totteridge Lane. Estimated cost £11,900.

Dewsbury, Yorks.—B.C. recommended to approve scheme for lighting the new Aldams Road/Wakefield Road ring road. Estimated

#### CONTRACTS

Full details of the Contracts marke! \*will be found in our Advertisement Columns.

BUILDING AND DECORATING

BUILDING AND DECORATING
(See also Housing Schemes)
Aberdare, Glam.—Replacing 66 grates in houses, for U.D.C. Documents from the Engineer and Surveyor, Vestry Hall, Aberdare. Tenders by January 12.
Ampthill, Bedford. — Exterior painting of some 342 dwellings during the period April 1, to Oct. 31, 1962, for R.D.C., as follows: Aspley Guise (86); Clophill (one); Cranfield (two); Flitwick (62); Husborne Crawley (four); Marston (50); Shillington (74); Lower Stondon (56); Westoning (seven). Applications to the

Marston (50); Shillington (74); Lower Stondon (56); Westoning (seven). Applications to the Engineer and Surveyor, The Limes, 12 Dunstable Street, Ampthill, Bedford, by Jan. 1. Aylesbury, Bucks.—Erection of a block of nursery factories comprising four units of 2350 sq. ft. and one unit of 4,700 sq. ft. at Stocklake Industrial site, for B.C. Documents from the Resident Architect, 16 Walton Street, Aylesbury, on December 28. Deposit £2 2s. Tenders by January 18.

\*Basildon, Essex. — Cricket and hockey pavilion, for U.D.C. Deposit £2 2s. Tenders by Jan. 5.

pavilion, for U.D.C. Deposit £2 2s. Tenders by Jan. 5.

Belfast.—Erection and completion of Rural science greenhouse and potting shed at Graymount Secondary School for Girls, Gray's Lane, for City Council. Documents from City Architect's Department, 40 Academy Street, Belfast I. Tenders by January 4.

Birkenhead, Ches.—Erection and completion of an aged persons social centre, at Victoria Park, for B.C. Documents from Borough Architect, 3 Conway Street, Birkenhead, Deposit £1 1s. Tenders by January 17.

Bighton, Sussex.—External painting of the Fizherbert Roman Catholic Secondary School, West Wing adjoining Warren Road, Woodingdean, for B.C. Documents from the Borough Surgery, Engineer and Planning Officer, 26-30, King's Road, Brighton. Deposit £1 1s. Tenders by January 5.

Cheadle and Gatley, Ches.—External painti-

Aug's Road, Brighton, Deposit £1 Is, Tenders by January 5.

Cheadle and Gatley, Ches.—External painting and renovation of 253 houses and 16 flats, for U.D.C. Documents from the Housing Officer, 2 Ashfield Road, Cheadle. Tenders by Jan. 8.

Cheshire.—Erection of extensions to Alsager County Secondary School (approximate value 140,000), for C.C. Applications to Edgar Inherner county architect. County Hall, Chester, by January 2, Deposit £2 2s, payable to

C.C. Drawings seen at the office of R. S. Biggins and Associates, Richmond Place, Boughton, Chester. Tenders by February 1. Clutton, Som.—Exterior painting and repair of the following dwellings, for R.D.C.:—Cameley (Oaklands) 12 houses; Chew Magna (agricultural) two houses; Chew Stoke (Townsend) 24 houses; Chilcompton (Stockhill) 20 houses; Farmborough (Hunstrete Road) eight houses; Farmborough (Bouthover) 12 houses; Paulton (Rogers Close) 50 houses; High Littleton (Southover) 12 houses; Paulton (Rudgeway Road) 20 houses; Paulton (Rudgeway Road) 10 houses; Stanton Drew (The Circle) 12 houses; Stowey-Sutton (Woodcroft) 12 houses. Documents from the Housing Manager, Council Offices, Temple Cloud, Bristol, Tenders by January 16.

Coldstream, Berwick.—Alterations at Bookie Lane public conveniences for B.C., including the following trades; (1) Builder and plasterwork; (2) joinerwork; (3) plumberwork; (4) painterwork. Documents from the Burgh Surveyor, Coldstream. Tenders by Jan. 5.

Devizes, Wilts.—Improvement to provide modern conveniences at 13 houses at West Lavington, for R.D.C. Documents from the Surveyor, Browfort Devizes. Tenders by January 6.

Dublin.—New Science Buildings, Belfield.

modern conveniences at 13 houses at West Lavington, for R.D.C. Documents from the Surveyor, Browfort Devizes. Tenders by January 6.

Dublin.—New Science Buildings, Belfield. Stillorgan Road, for University College. The total floor area is approximately 300,000 sq. fr. Applications, stating experience in carrying out large-scale building works and giving particulars of similar works satisfactorily completed or in progress, to J. P. MacHale, the secretary, University College, Dublin, Earlsfort Terrace, Dublin, 2, by December 31.

Durham. — Following for C.C.: Bowes Museum, Barnard Castle—(a) electric heating and lighting to office accommodation, (b) alterations and improvements; Boldon County Junior School—(a) vinyl tile flooring, (b) hardwood block flooring, (c) electrical installation, (d) tar paving, (e) playing field preparations; Hare Law New Day School—fixed furniture and benches; Witton-le-Wear County School—renewal of floors; Durham Whinney Hill Modern Schools—additional toilet facilities. Durham County Police Authority: Standard police houses, Primrose Hill, Burnmoor—erection. Applications to County Architect, South Street, Durham, by Dec. 27.

East Riding.—Replacement of farm buildings at Heads Lane, Hessle, for C.C. Applications to the County Architect, County Hall, Beverley. Tenders by December 28.

Egham, Surrey.—Improvements and repairs of four properties at 123 and 125, Thorpe Lea Road, 85 Bond Street and 22 Langham Place, for U.D.C., including the provision of a bathroom, alterations to the kitchen, the installation of a hot water system and general repairs and decorations, Documents from the Engineer and Surveyor, Fire Station Buildings, High Street, Egham. Tenders by January 1.

Essex.—Following for C.C.: (1) Chelmsford Moulsham County Infants' School—extensions in load-bearing brickwork and some adaptations to existing buildings, approximate cost £89,000. Separate applications to H. Conolly, county architect, County Hall, Chelmsford, by Dec. 27.

Essex.—Following for C.C.: (1) Chelmsford houses

anciding a new gymnasium, assembly hall and ancillary accommodation in traditional construction with steel frame. Estimated cost £65,000. Applications to H. Conolly, county architect, County Hall, Chelmsford, by Dec. 27.

architect, County Hall, Chelmsford, by Dec. 27.

Grimsby, Lines.—Following works required in the erection of the Grange Primary Junior School, Cambridge Road, for Education Committee: Contract A—General building contract, including foundations and superstructure, together with drainage, roads, paths, fencing, playground and other ancillary works; B—heating and hot water installations with oil-fired boiler plant; C—electrical installation. Documents from the Office of J. V. Oldfield, borough engineer and architect, Municipal Offices, Town Hall Square, Grimsby. Deposit 55 each. Tenders by January 12.

Hemel Hempstead, Herts.—Construction of a garage, the partial demolition and rebuilding of a garage, construction of brick forecours walls and close-boarded oak fences at premises in Tile Kiln Lane, for B.C. Documents from A. H. Turner, borough engineer, High Street, Hemel Hempstead, Tenders by January 8.

Hford Essex.—Conversion of four common

High Street, Hemel Hempstead, Tenders by January 8.

Ilford, Essex.—Conversion of four common rooms into bed-sitting room flats at Beehive Court, Little Gearies, Mossford Court and Maypole Court, for B.C. Applications to the Borough Engineer, Town Hall, Ilford, Deposit 22 2s. Tenders by January 23.

Ipswich, Suffolk.—Erection of stage four of the Civic College, which will provide approximately 20 new teaching rooms in an extension to one of the existing eight-storey blocks, it also includes the conversion to

different uses of approximately 14 existing room, for B.C. Applications to Johns, Slater and Haward, architects, 32 Foundation Street, Ipswich, by January 5, Deposit £5 5s. cheque payable to Corporation, Tenders by February 12

ary 21.

Kilkenny, Eire.—Erection of a vocational school, together with sundry site works, at Castlecomer, for County Vocational Educational Committee Documents from Cunningham and O'Cochlain, architects and engineers, 74 High Street, Kilkenny. Deposit £15 15s. Plans also seen at the offices of Gabriel M. Cleere, chartered surveyor, 11 Ely Place, Dublin 2, Tenders by January 8.

Leicester —Alterations and additions to 12

Cleere, chartered surveyor, 11 Ely Place.
Dublin 2. Tenders by January 8.

Leicester.—Alterations and additions to 12
Bishop Street, for City Council. Documents from the City Architect's Office, Halford House, Charles Street, Leicester. Deposit £1, cheques payable to City Treasurer. Tenders by Jan. 16.

Luton, Beds.—Modernisation of the following pre-war properties for R.D.C.: Sixteen houses at Streatley; six houses at Sharpenhoe. Applications to the Engineer and Surveyor to the Council, 48 Bute Street, Luton. Deposit £1 fs., payable to R.D.C. Tenders by Dec. 29.

Luton, Beds.—Design, supply, delivery and erection of structural steelwork for extensions to Secondary Technical School, for B.C. Documents from Borough Architect, Town Hall, Luton. Tenders by Jan. 9.

Macclesfield, Ches.—Following for R.D.C.: (a) Installation of washbasins and plastering bathrooms at 12 houses, The Fold, Prestbury; (b) electrical rewiring at 28 houses, Lower Park Crescent, Poynton; (c) demolition of Merchills Cottage, Marthall, Chelford. Documents from the office of the Engineer and Surveyor, Council Offices, King Edward Street, Macclesfield. Tenders by Jan. 8.

Manchester.—Erection of laboratory at the Waterworks Depot, Denton, for City Council Documents from City Architect, P.O. Box 488, Town Hall, Manchester. Tenders by January 13.

\*Newtown and Llanidloes, Monts.—Public conveniences. Liangurig for R.D.C.

ary 13.

\*Newtown and Llanidloes, Monts.—Public conveniences, Llangurig, for R.D.C. Apply by Jan. 6. Deposit £2 2s.

North Riding.—Alterations of former grammar school, Thirsk, for Co. E.C. Documents from the County Architect, County Hall, Northallerton. Tenders by February 1.

North Riding.—Erection of Girls' County

North Riding.—Alterations of former grammar school, Thirsk, for Co. E.C. Documents from the County Architect, County Hall, Northallerton. Tenders by February 1.

North Riding.—Erection of Girls' County modern school, Scarborough, for Co.E.C. Documents from the County Architect or J. H. Napper and Partners, architects, 133 Osborne Road, Newcastle-upon-Tyne, 2. Plans may be seen at the County Hall, Northallerton. Tenders by Jan. 30.

North Riding.—Erection of a new police station, court house and weights and measures office at Pickering, for C.C. Applications to the County Architect, County Hall, Northallerton. Tenders by February 2.

Nottingham.—Cleaning and painting at the undermentioned buildings, for City Education Committee. Internal and external—Blue Bell Hill School, Blue Bell Hill Road, Burford School, Oxclose Lane, Arnold, Charnwood School, Farnborough Road, Clifton Estate, Croft Nursery School, St. Peter's Street, Radford, Douglas School Annexe, Althorpe Street, Creencroft Junior School, Greencroft, Clifton Estate, Mundella School Annexe, Collygate Road, Tent Bridge School (Secondary Boys' and Girls' departments), Green Street, Victoria Nursery School, Bath Street, Westbury School, Lortas Road, New Basford. Internal—Brooksby School Brooksby Lane, Clifton Estate, New Basford Voluntary C. of E. School (part). High Church Street, New Basford, A'court Street School Kitchen, A'court Street, Brierley Nursery School, kitchen, Brierley Street, Meadows, Greencroft School, kitchen, Gainsford Crescent, Bestwood Estate, Margaret Glen-Bott School, kitchen, Sutton Passeys, Crescent, Wollaton Park, Milford School, kitchen, Listowel Crescent, Clifton Estate, Royal Bravenent School, kitchen, Gainsford Crescent, Bestwood Estate, Margaret Glen-Bott School, kitchen, Sutton Passeys Crescent, Wollaton Park, Milford School, kitchen, Listowel Crescent, Clifton Estate, Rosehill School, kitchen, Perry Road, Sherwood Documents from the Education Office (Sites and Buildings) Departments). Exchange Buildings, Smithy Row, Nottingham

Oxford. — Extension at Blackbird Leys County Primary School by the addition of seven classrooms and ancillary accommodation, to be built in traditional construction, for City Council. Applications to the City Architect and Planning Officer, Town Hall, Oxford, by Dec. 27.

Perth and Kinross.—Following trades in connection with the erection of a new school for mentally handicapped children at Scone (total floor area about 36,000 sq. ft.), for Joint C.C.: Excavator, concrete and brick works; carpenter and joiner works; plumber work; plaster work; roof tiler and roughcast works; electrical work; and glazier work. Contractors for electrical work must be on the approved roll of the National Inspection Council. Contractors may quote for any or all of these trades. Applications, with a statement of the trade or trades, to the County Architect, New Schools Section, Old Academy Buildings. Rose Terrace, Perth, by December 23.

Port Talbot, Glam.—Erection of a sports pavilion at Little Warren, Sandfields, for B.C. Documents from G. V. Griffiths, borough engineer and surveyor, Municipal Buildings, Port Talbot, Clam.—Erection of five public conveniences at various sites (Baglan, Margam and Sandfields), for B.C. Documents from G. V. Griffiths, borough engineer, Municipal Buildings, Port Talbot. Deposit £2 2s. Tenders by January 16.

Pudsey, Yorks.—Separate trades for 12 flats

ings, Port Talbot. Deposit £2 £8. Tenders ings, Port Talbot. Deposit £2 £8. Tenders in three blocks, at Burton Street, for B.C. Applications to the Borough Surveyor, Town Hall, Pudsey, Deposit £2 2s. each trade. Tenders by January 6.

Hall, Pudsey, Deposit £2 2s. each trade, 1enders by January 6.

Rochdale, Lancs,—Internal painting and docorating, day nurses' home, Birch Hill Hospital, for Rochdale and District Hospital Management Committee. Documents from G. R. Eastwood, group socretary, Central Offices, Birch Hill Hospital, Rochdale, Tenders by Dec. 27.

Management Committee. Documents from G. R. Eastwood, group secretary, Central Offices, Birch Hill Hospital, Rochdale. Tenders by Dec. 27.

Rushden. Northants. — Re-decoration and wall tiling in Newton Road public convenience, for U.D.C. Documents from the office of the Surveyor, Council Buildings, Rushden. Tenders by February 2.

St. Ives. Hunts.—Repairs and improvements to 42 houses, for B.C. Documents from the Borough Surveyor, Town Hall, St. Ives. Tenders by December 30.

Scotland.—Carolina Port Generating Station, Dundee, for North of Scotland Hydro-Electric Board, comprising the demolition of existing steel-framed sheds, diversion of drains, the erection of site buildings, etc. Documents from Strain and Robertson, engineers, 5 Park Circus, Glasgow, C.3. Deposit £5 5s.

Somerset. — Erection of Bournville Boys' Secondary Modern School, Weston-super-Mare; Yeovil Day Special School, for C.C. The schools are designed in Derwent construction on the basis of 520 and 134 cost places, with areas of approximately 41,000 and 10,000 sq. ft., and contract periods of 18 and 12 months respectively. Applications to B. C. Adams, county architect, The Crescent, Taunton, by Jan. 1.

Southampton.—Improvements to housecraft rooms, etc., at Swaythling Secondary School, for B.C. Applications to Borough Architect, Civic Centre, Southampton, by Dec. 23. Tenders by Jan. 29.

Southport, Lancs.—Interior and exterior painting work to various structures under the control of the Parks and Cemeteries Committee, for B.C. Work to be carried out during February/March, 1962. Documents from the Borough Architect and Town Planning Officer, 99-105 Lord Street, Southport, Leposit £1 ls. Tenders by January 11.

Swassea.—Conversion of Peniel Green Infants' School, Llansamlet, into a youth club. for B.C. Applications to the Borough Architect, The Guildhall, Swansea, by December 29. Deposit £5.

\*Watford, Herts.—Erection of a building afrove Waterworks, for B.C. Apply by Feb. I.

Peposit £5.

\*Watford, Herts.—Erection of a building at Grove Waterworks, for B.C. Apply by Feb. 1.

Deposit £2.

\*Watford, Herts.—Proposed factory—

\*Watford, Herts.—Proposed factory—Proposed factory—

\*Watford, Herts.—Proposed factory—Proposed factory—Propos

Deposit £2.

\*Watford, Herts. — Proposed factory—Holywell estate, for B.C. Apply by January 1. Tenders by January 22.

West Riding.—Construction of toilets and corridor, including builder, joiner, roofer and plumbing services at Sowerby Bridge Norland C.E. (Controlled) J.M.I. School, for C.C. Applications to the office of the Divisional Architect, Flint Street, Huddersfield. Tenders by January 9.

West Riding.—Conversion of cells to provide messing and toilet facilities at the Harden Police Station, for C.C. Applications to the Divisional Architect, Salisbury Buildings, Albert Street, Harrogate. Tenders by January 12.

Albert Street, Harrogate. 1 enders by January 12.

West Riding.—Following works for C.C.: (1)
Improvements to staff flats at Selby Secondary
Technical School, Brooklands annexe (general
building contractors); (2) reorganisation of
kitchen at Brotherton County School (general
building contractors); (3) rebuilding of boundary wall in brick and the provision of a
vehicle access at (emsworth R.C. School
(general building contractors); (4) provision
of a hard playing area at Maltby C.E. (Controlled) School; (5) construction of toilets and
corridor including builder, joiner, roofer and

plumbing services at Sowerby Bridge Norland C.E. (Controlled) J.M.I. School. Applications for contracts (1), (2) and (3) to the Divisional Architect, Bishopgarth, Westfield Road, Wakefield; for contract (4) to the office of the Divisional Architect, Planet Road, Adwick-lestreet, Doncaster; and for contract (5) to the office of the Divisional Architect, Flint Street, Huddersfield. Tenders by Jan. 9.

West Suffick — London-Nowich trunk road

Street, Huddersfield. Tenders by Jan. 9.

West Suffolk.—London-Norwich trunk road A.11. Construction of 70 lin. yd, of wall 7ft, high, in 9in., 13½in. and 18in. brickwork at Barton Mills, for C.C. Bricks will be supplied on site by C.C. Documents from the County Surveyor, Manor House, Bury St. Edmunds. Tenders by January 15.

Wycombe, Bucks.—Erection of ten brick built garages and tarmac forecourt on a site off Clifford Road, Princes Risborough, for R.D.C. Documents from the Engineer and Surveyor, 8/9 Easton Street, High Wycombe. Tenders by January 13.

#### CLOTHING AND TEXTILES

Angus.—Supply of police clothing as follows, for Constabulary.—Jackets, trousers, shirts, greatcoats, collars, ties, caps, leather gloves, policewomen's jackets, skirts, and black nylon hose. Applications to the Chief Constable, Angus Constabulary, County Buildings, Forfar. Tenders by January 15.

\*Dorset.—Police clothing for C.C. Tenders by Jan. 18.

\*Northern Ireland—Supply of professional contents of the con

stable, Angus Constabulary, County Buildings, Forfar. Tenders by January 15.

\*Dorset.—Police clothing for C.C. Tenders by Jan. 18.

\*Northern Ireland.—Supply of waterproof clothing for Ministry of home affairs.

\*Oxford.—Police and fire brigade uniforms, for City Council. Tenders by Jan. 24.

Suffolk and Ipswich.—Supply of uniform and equipment, for Fire Authority; 180 double-breasted fire tunics; 300 pairs fire trousers (note to Cloth T71A) to specification 2A; 136 firemen's serge jackets (see special note in specification); 190 pairs firemen's black shoes; 100 firemen's caps; 95 overall jackets; 95 pairs overall trousers (without bib and brace) (see special note on tender form); 50 pairs black leggings; 90 pairs rubber knee boots with stout loose leather insoles; 70 firemen's raincoats; eight officers' raincoats; 260 firemen's black ties; 36 officers' black ties; 50 leather belts; 25 leather pouches; 186 firemen's blue shirts—single cuffs; 62 sub-officers' and L.Fm. blue shirts (see special note on tender form); 144 pairs heavy navy blue socks; 276 black nylon cashmere, or similar, black socks — unshrinkable; four firewomen's white collars (Van Heusen); 12 firewomen's white collars (Van Heusen); 12 firewomen's white collars with loose linings; 12 pairs officers' unlined brown leather gloves. Documents from the Chief Fire Officer, Suffolk and Ipswich Fire Service, 1 Rose Hill Crescent, Ipswich, Suffolk, Tenders by January 2.

Wolverhampton, Staffs.—Supply of overalls for the financial year ending March 31, 1963, for B.C. Documents from the Borough Engineer, Town Hall, Wolverhampton. Tenders by January 15.

#### DEMOLITION

DEMOLITION

Egham, Surrey.—Demolition of buildings at 1-5 Armstrong Road, for U.D.C. Documents from the Engineer and Surveyor, Council Offices, Egham. Tenders by January 26.

Harrogate, Yorks.—Demolition of property, as follows, for B.C. 1, 2 and 3 Lion Cottages and adjoining workshop; 4, 4a, 4b, 6 and 6b Tower Street. Documents from the office of the Borough Engineer, Municipal Offices, Harrogate. Tenders by Dec. 28.

Lostwithiel, Corn.—Demolition of existing buildings, clearance, and preparation work on the Tangier Site, for B.C., where it is proposed to erect 12 old people's flats in two blocks, for which separate Tenders will be invited in due course. Documents from the Borough Surveyor, Council Offices, Lostwithiel. Deposit £2 2s. Tenders by January 1.

\*Manchester.—Demolition and clearance of 283 premises for City Council. Tenders by Jan. 2.

North Shields, Northumb.—Purchase, dismantling and removal of the superstructure of Howdon Staith, for Tyne Improvement Commission, comprising approximately 270 tons of steelwork and other materials. Documents from R. N. Eggleton, secretary, Tyne Improvement Commission, Bewick Street, Newcastle upon Tyne 1. Deposit £2 2s. Tenders by January 15.

Sunderland, Dur.—Demolition of Southwick House and adjoining buildings, for B.C. Documents from the Borough Engineer, 27 Fawcett Street, Sunderland. Deposit £1 1s. Tenders by December 27.

#### ELECTRICAL

Belfast.—Following for City Council: (a) ectrical installation; (b) heating installation; plumbing installation, for proposed old

people's home Wilmont House, Dunmury, Documents from Abbott and Partners, consulting engineers, 16 May Street, Belfast 1. Tenders by January 15.

Leicestershire. — Rewiring of electrical installation at Ashby-de-la-Zouch County Junior School, for C.C. Applications to County Architect, 123 London Road, Leicester, by December 29. Deposit £2 2s. Tenders by January 22.

Manchester.—Electrical installation

January 22.

Manchester.—Electrical installation to proposed workshop at St. Joseph's Police Buildings, Longsight, for City Council. Documents from the City Architect, P.O. Box 488, Town Hall, Manchester. Tenders by January 8.

Skipton, Yorks. — Rewiring 149 pre-war houses, Burnside estate, for U.D.C. Documents from Engineer and Surveyor, Town Hall, Skipton. Deposit £2 2s. Tenders by Jan. 8.

#### FENCING

\*Bootle, Lancs. — Boundry fencing to stadium, for B.C. Tenders by Jan. 16.

\*Carrickfergus, Antrim. — Supply of the following, for B.C.: (a) Forty eight Rolls, 25yd, long plastic-coated chain link fencing, 6ft. wide of 2in. mesh and 10½ overall gauge, coloured green per roll; 3,600yd, plastic-coated line wire, 10½ overall gauge, coloured green per roll; 400yd, plastic-coated annealed wire for stirrups, 12 gauge, coloured green per roll; 410b, plastic-coated ying wire, coloured green per lb. Tenders endorsed "Tender for Chain Link Fencing." to "The Mayor, Town Hall, Carrickfergus." by noon, January 2.

\*Godalming, Surrey.—Erection of rear fences at approximately 140 houses at Farncombe, for B.C. Documents from the Borough Engineer and Surveyor, Branksome, Filmer Grove, Godalming. Tenders by Jan. 1.

\*Kidderminster, Worcs.—Supply and erection of approximately 418 lin. yd, of chain link fencing on various sites, for B.C. Documents from J. G. Stewart, borough engineer and surveyor, 110 Mill Street, Kidderminster. Tenders by January 3.

\*Salford, Lancs.—Supply of fencing and gates, for City Council. Tenders by December 30.

\*Surrey.—Supply and erection of approximately 12 and erection of approximately 14 and erection of approximately 15 and 16 approximately 16 and 16 approximately 16 and 16 approximately 16 and 16 approximately 16 approximately 16 and 16 approximately 16 approximately 17 and 17 approximately 17 and 18 approximately 18 and 18 approximately 18 and 18 approximately 18 and 18 approximately 18 approximately 18 and 18 approximately 18 app

gates, 1

gates, for City Council. Tenders by December 30.

Surrey.—Supply and erection of approximately 640 lin. yd. chain link fencing at Chevington Farm, Bletchingley (Maidston-Guildford Road, A.25), for C.C. Documens from County Engineer, County Hall, Kingston upon Thames. Tenders by January 6.

Wokingham, Berks.—Supply and erection of 416 lin. yd, of chain link fencing at the California caravan site, Nine Mile Ride, Finchampstead, for R.D.C. Documents from the Chief Engineer, Council Offices, Shute End, Wokingham. Tenders by December 28.

#### GAS AND WATER SUPPLY

GAS AND WATER SUPPLY

Angus.—Edzell Water Supply, renewal of water mains in Ramsay Street, Inverseandye Road and New Street, for C.C., involving supplying and laying approximately 601 lin. yd. 4in. diameter a.c. pipes, class C and 220 lin. yd. 3in. diameter a.c. pipes, class C and 220 lin. yd. 3in. diameter a.c. pipes, class C, with valves, specials, etc., including transferring existing service connections. Documents from the Office of the County Engineer, County Buildings, Forfar. Tenders by January 15.

\*Blackpool, Lancs. — Construction of reservoir, contract 160, for Water Board. Tenders by Jan. 15.

\*Blofield and Flegg, Norfolk.—Laying of approximately 2,500yd, of 3in. spun iron pipes in fields and roads in Mautby Parish, for R.D.C. Documents from the Department of the Engineer and Surveyor, Council Offices, Acle, Norwich, Norfolk, NOR 61Z. Deposit £2 2s. cheque payable to R.D.C. Tenders by December 31.

\*Brighton, Sussex.—Submersible borehole pumps, for B.C. Deposit £3. Tenders by January 26.

\*Bury, Lancs.—Improvement of the Clarence Reservoir comprising approximately 450 lin. yd, of mass concrete retaining wall, footpaths and ancillary works, for B.C. Documents from Borough Engineer, Town Hall, Bury. Deposit £2 2s. Tenders by January 8.

\*Downpatrick, Down.—Water main extensions, contract W.D.2, for R.D.C. including the laying of approximately 20,000 lin. yd, of spun-iron water main. Documents from the Engineer's Office, Quoile Road, Downpatrick. Tenders by January 5.

\*East Lothian.—Laying pipeline, for water Board. Deposit £5 5s. Tenders by Jan. 12.

Londonderry.—Supply and installation of electrically driven centrifugal type pumping equipment capable of pumping water at the rate of 500 gallons per minute through approximately 365ft. head at Carmoney, for R.D.C. Documents from W. D. R. and R. T. Taggar, the proposit £2 2s. Tenders by Jan. 12.

\*North East Warwickshire.—Scraping of small-diameter water mains for Water Board. Deposit £2 2s. Tenders by Jan. 17.

Norwich.—Sinking of a 30in, diameter borchole, 250ft, deep, on a site adjacent to Thorpe Road, to obtain water from sands, gavels and chalk, for City Council. Documents from the office of the Water Engineer and Manager, City Hall, Norwich, NOR 01A. Tenders by January 23.

\*South Cardiganshire.—Mainlaying contract 56, for Water Board. Deposit £3 3s. Tenders by January 15.

West Lancashire.—Scarishrick, Waterworks.

56, for Water Board. Deposit 23 38. Tenders by January 15.

West Lancashire.—Scarisbrick Waterworks, contract 23, for Water Board, including laying approximately 1,200yd. of 15in. asbestos ement water main and excavating approximately 2,700yd. of trench for electric cables. Site of works is between Southport and Ormskirk. Documents from the Engineer and Manager. 14 Portland Street, Southport, Tenders by January 15.

# HARBOURS, PIERS AND SEA DEFENCE WORKS

Portland, Dorset.—Construction of approximately 67yd. of mass concrete sea wall, and incidental works, as West Weares, Cheshil, for U.D.C. Documents from E. B. Cullin, engineer and surveyor, Council Offices, Portland, Tenders by January 29.

Swansea.—Construction of a steel sheet pile wall 170ft. long, with anchorage blocks and ties, at Blackpill, on the seafront, and the area behind the wall is to be filled with bardcore, for B.C. Documents from the Borough Engineer and Surveyor, Guildhall, Swansea. Tenders by January 26.

#### HEATING AND VENTILATING

Birmingham.—Installation of partial central heating, hot and cold water and gas supply services in four B type family homes, two to be built on West Heath estate and two on Bartley Green estate, for City Council. Documents from the office of Sir Herbert J. Manzoni, City engineer and surveyor, Basker-ville House, Civic Centre, Birmingham, 1. Deposit £2 2s. Tenders by Feb. 1.

peposit Le 25. lenders by Feb. 1.

\*Fdgware, Middx.—New central boiler plant
for North West Metropolitan Regional Hospital Board. Apply by Jan. 15.

\*Liverpool.—Supply and fixing boilers at
Woodlands School, for City Council. Tenders

by Jan. 3.

Melton and Belvoir, Leics.—Installing hot Metion and betvoir, Letcs.—Installing not water systems in pre-war houses situated in the following villages: (1) Sproxton four houses; (2) Stathern nine houses. Applications to the Engineer and Surveyor, Warwick Lodge, Dalby Road, Melton Mowbray. Tender by Langary 1 lodge, Dalby Road ders by January 1.

#### HOUSING SCHEMES

HOUSING SCHEMES

Argylishire.—Six houses on Gigha comprising two of two apartment, two of three apartment and two of four apartment for C.C. Applications to the County Architect, County Offices, Dunoon.

Bathavon, Som.—Holcombe Lane, Bathampon, near Bath. Erection of (a) old people's dwellings and warden's block (b) twenty-two raditional three-bedroom houses, for R.D.C. Tenders are invited from experienced constators for the proposed works, consisting of: Contract A: Erection of 15 single storey dwellings, two blocks of six flats, one block of eight flats and a warden's bouse comprising a communal meeting room and flat, together with paths, site works and all domestic services. Contract B: Erection of 22 traditional type three-bedroom houses, together with paths, limited site works and all domestic services. Applications to flumphrey Goldsmith and Partners, architects, 18 Gay Street, Bath, by Dec. 30. Deposit 33s., cheque payable to R.D.C.

Crickhowell, Brecons. — One three-bedroomed house; two two-bedroomed flats, and one-bedroomed bungalow together with a mall sewage plant and site works at their site at Glasfryn, Bwlch, for R.D.C. Documents from Merton Jones and Richards, architects, all in traditional construction, in Oak Street, Bath, by Dec. 30. Deposit 23 3s., cheque payable to Council. Tenders by January 15.

Dudley, Worcs.—Twenty-two dwellings, in pairs of houses and blocks of two-storey flats, all in traditional construction, in Oak Street, S. Ednam Road, Dudley, by Jan. 1. Denosit £2 2s., cheques payable to Corporation.

East Sussex.—Four fremen's houses, for C.C. Applications to County Architect, 5. Folkestone.—Six old people's dwellings (in wo storeys). Bridge Street, for B.C. Applications to the denomen house, 2.10 in the storeys and people's dwellings (in wo storeys). Bridge Street, for B.C. Applications to the people and p

Folkestone.—Six old people's dwellings (in two storeys). Bridge Street, for B.C. Applications to E. L. Allman, borough engineer, 2-10 West Terrace, Folkestone, by Dec. 29. Deposit 2 2s.

Guildford, Surrey.—Sixty-seven pairs (three-bedroom) houses at Park Barn, and 12 (one-bedroom) flats in two blocks at Boxgrove Arenue, for B.C. Applications to the Borough Engineer and Surveyor, Municipal Offices, fligh Street, Guildford. Tenders by Jan. 16.

Hamilton, Lanarks.—Eight two apartment houses and 11 garages at Eliot Crescent, for B.C. Applications to Burgh Architect, 56 Brandon Street, Hamilton, by December 26. Deposit £2.

posit £2.

Huntingdon.—Ten bungalows and eight flats, with associated roadworks, at Sawtry, for R.D.C. Documents from the Surveyor, Montagu House, Huntingdon. Deposit £2 2s. Tenders by January 24.

Montagu House, Huntingdon. Deposit £2 2s. Tenders by January 24.

Isle of Ely.—Pair of houses, Meadowgate Lane, Wisbech, for C.C. Applications to the County Architect, County Hall, March, Cambs, by December 28. Tenders by January 29.

Kendall, Westmorland.— Extension of Sandylands estate (second section), 196 dwellings in 64 blocks, for B.C. Documents from J. Lefevre, borough engineer and surveyor, Municipal Offices, Lowther Street, Kendal, Deposit £2 2s. Tenders by January 10 Lymington, Hants.—One block of six flats and one pair of bungalows on site 34 Danecrest Road, Hordle, for B.C. Documents from the office of the Borough Engineer, Town Hall, Lymington. Deposit £2 2s. Tenders by Jan. 4.

Nottingham.—Two hundred and twenty houses, 34 flats six bungalows and 91 garages on the Bestwood Park estate, for City Council. Applications to E. W. S. Martin, The Estates Surveyor and Valuer, The Guildhall Nottingham by first post January 1. Deposit £2 2s. payable to Corporation. Tenders by January 30.

\*Rei-ate, Survey.—Four houses, etc., Rednill, for B.C. Deposit £2 28. \*Rei-ate, Surrey.—Four houses, etc., Redhill for B.C. Deposit £2 2s, Tenders by January 9

for B.C. Deposit £2 2s, Tenders by January 9.

Tonbridge, Kent.—Sewage works manager's house, Vale Road East, for U.D.C. Applications to John Taylor and Sons, consulting engineers, Artillery House, Artillery Row, Westminster, London, S.W.l. Deposit £3 3s, cheque payable to U.D.C. Tenders by Jan. 17.

West Mersea, Essex.—Two pairs of one-bedroom type bungalows, extension of road, footpath and sewer at Windsor Road, for U.D.C. Applications to Sparrow and Clater, chartered architects, 52 North Hill, Colchester, by Jan. 1. Deposit £2 2s. Tenders by Jan. 29.

#### MATERIALS AND SUPPLIES

MATERIALS AND SUPPLIES

Aberdare, Glam.—Following for the year ending March 31, 1963, for U.D.C.: (i) From manufacturers and suppliers of repute, for the supply and delivery of (1) building sand, (2) common and facing bricks, (3) Portland cement and lime, (4) glass, (5) dry road metal and tarmacadam, (6) road tar and bitumen compounds, (7) concrete kerb and paving slabs, (8) bass and soft sweeping brooms, (9) paint brushes, (10) solder, (11) coal and coke, (12) small tools, (13) manhole and inspection frames and covers, and gully gratings and frames, (14) electric lamps, (15) tyres, (16) external wooden doors; (ii) from experienced contractors for the execution of (17) road surfacing works, (18) road retread works, (19) surface dressing works, (20) heating and planing of highways, (21) cleaning and scraping of watermains. Documents from the Engineer and Surveyor, Vestry Hall, Aberdare. Tenders by January 19.

\*Ashford, Kent.—Supply of materials for U.D.C. Tenders by Jan. 19.

\*Bangor, Down.—Supply and delivery of the

Ashrora, Kent.—Supply of materials for U.D.C. Tenders by Jan. 19.

Bangor, Down.—Supply and delivery of the undernoted items for one year from April 1, 1962, for B.C.; (1) Hardware, etc; (2) scavenging brushes and brush shafts; (3) toilet paper; (4) precast concrete flags; (5) precast concrete kerbs; (6) road binding materials; (7) tarmacadam, stones, etc.; (8) petrol; (9) fuel oils; (10) ashbins; (11) sulphate of alumina; (12) surface dressing and tarmacadam surfacing, etc.; (13) sand; (14) feeding stuffs (wheat and canary mixture); (15) pedestrian crossing markings, white and yellow lines and letters. Documents from T. B. Graham, town clerk, Town Hall, The Castle, Bangor. Tenders by January 16.

\*Basildon, Essex. — Materials and services for U.D.C. Tenders by Jan. 26.

Belfast.—Supply and deliery of conveyor belting, for City Council, Documents from Gas Works, Ormeau Road, Belfast 7. Tenders by January 4.

\*Berhill Sussex—Supply of the following

Works, Ormeau Road, Belfast 7. Tenders by January 4.

Bexhill, Sussex.—Supply of the following during the year ending March 31, 1963, for B.C.: (1) (a) Tarmacadam—approximately 150 tons of slag or granite tarmacadam in various sizes, (b) tarmacadam—approximately 500 tons of Kent ragstone base course in various sizes, (c) 500 tons \( \frac{1}{2} \) in. to dust cold asphalt, (d) 100 tons \( \frac{1}{2} \) in. to dust cold asphalt, (e) 250 tons (more or less) bitumen macadam with granite aggregate complying with B.S. 1621, and suitable for machine laying \( \frac{1}{2} \) in. nominal size wearing course (table 4), (f) 1,000 tons (more or less) bitumen macadam with granite aggregate complying with B.S. 1621, and suitable for machine laying \( \frac{1}{2} \) in. nominal size wearing course (table 5); (2) (a) 350 tons \( \frac{1}{2} \) in. clean British granite chippings, (b) 50 tons \( \frac{1}{2} \) in. clean British granite chippings, (d) 50 tons \( \frac{1}{2} \) in. clean British granite chippings, (d) 50 tons \( \frac{1}{2} \) in. clean British granite chippings, (d) 50 tons \( \frac{1}{2} \) in. clean British granite chippings, (d) 50 tons \( \frac{1}{2} \) in. clean British granite chippings, (d) 50 tons \( \frac{1}{2} \) in. clean British granite chippings, (d) 50 tons \( \frac{1}{2} \) in. clean British granite chippings, (d) 50 tons \( \frac{1}{2} \) in. clean British granite chippings, (d) 50 tons \( \frac{1}{2} \) in.

described in clause 6; (4) bricks, cement, lime, sand and crushed beach; (5) paving slabs, and kerbs (with samples); (6) petrol, lubricating oils, grease, parafin and gas oil; (7) hired haulage. Applications to the Borough Surveyor, Town Hall, Bexhill. Tenders by Lanuary 15.

and kerbs (with samples); (6) petrol, lubricating oils, grease, parafin and gas oil; (7) hired haulage. Applications to the Borough Surveyor, Town Hall, Bexhill. Tenders by January 15.

Bexley, Kent.—Supply of the following for the twelve months commencing April 1, 1962, for B.C.: (a) Precast concrete paving slabs; (b) precast concrete kerbs, channels, edging and quadrants; (c) cold asphalt; (d) hot rolled asphalt; (e) bituminous slag macadam; (f) lorry hire. Documents from the Borough Engineer, West Lodge, Broadway, Bexleyheath. Tenders by January 15.

Blyth, Northumb.—Supply of the following, for the year ending March 31, 1963, for B.C.: (1) Glazed earthenware and clayware pipes; (2) cement; (3) concrete gulleys and kerbs and flags; (4) tar and tar compounds; (5) tarred and bitumen macadam; (6) whinstone and gravel; (7) petrol and paraffin; (8) plasterboard, C.I. back boilers, C.I. c.w. cisterns, C.I. gutters, dustbins; (9) gas boilers; (10) gas mantles; (11) sinks, lavatory basins and w.c. pans; (12) solder; (13) fireplace fittings; (14) electric cables and fittings. Applications to the Borough Engineer, Municipal Buildings, Blyth. Tenders by January 10.

Bristol.—Supply, and where applicable, laying of undermentioned materials during 12 months, April 1, 1962, to March 31, 1963, for City Council: Manhole covers and frames; inspection chamber covers and frames; guly gratings and frames; galvanised malleable step irons; precast concrete flags; precast concrete kerbs; sand; sea-washed gravel; granite, basalt slag and quartitic chippings; tar and bituminous surface dressings; car and bituminous surface dressings; surface dressings; clean stone (concrete aggregate, etc.); bitumen macadam (supply and laying); fine cold asphalt; fine hot asphalt (supply and laying for footpaths); bituminous road surfacing mixtures (supply and laying); heating and planing; mixed concrete; propane and butane gas. Forms of tender, specifications and documents from City Engineering, Surveyor and Planning Officer, Cabot House, Deanery R

1. Tenders by January 15.

\*Chelmsford, Essex. — Supply of chemicals for Corporation Waterworks. Tenders by Jan. 1.

\*Cheshire. — Supply of materials and services, for C.C. Tenders by Jan. 15.

Cheshunt, Herts. — Following for the year commencing April 1, 1962, for U.D.C.: Hoggin, shingle, sand and ballast; tar and bituminous compounds; supply and spraying of tar and bituminous compounds; hired lorries; cement; concrete kerbs and paving slabs; paints, distempers and brushes (specified manufacturers only); refilling Lewin sweeper brushes; toilet rolls; protective clothing. Documents from the Engineer and Surveyor, Manor House, Cheshunt. Tenders by January 22.

Chigwell, Essex.—Supply of materials and services during period April 1, 1962, to March 31, 1963, for U.D.C.: (1) Tarred macadam—supply and lay by machine (4) cold asphalt—supply; (5) road tar—pressure sprayed on roads; (6) tar and bituminous compounds—pressure sprayed on roads; (7) cold bituminous emulsion—supply; (8) granite chippings; (9) clinker; (10) breeze; (11) portland cement—ordinary and rapid hardening; (12) washed ballast aggregate; (13) sand (gritting); (14) ready mixed concrete; (15) precast concrete kerb and edging; (16) brushes (lacre sweeper-collector machine); (17) hire of steam, petrol and diesel rollers; (18) emptying and resealing gullies; (19) hire of motor lorries; (20) tyres—supply. Applications, including a stamped addressed foolscap envelope to Engineer and Surveyor, Council Offices, Loughton, Essex. Tenders by January 15.

Colliers Wood.—Supply of the following for the year ending March 31, 1963, for C.C.: (1) Motor haul-reders by January 6.

Corwall.—Following during the year ending March 31, 1963, for C.C.: (1) Motor haul-

copperas. Applications to the Engineer to the Board, Sewage Purification Works, Byegrove Road, Colliers Wood, S.W.19. Tenders by January 6, Cornwall.—Following, during the year ending March 31, 1963, for C.C.: (1) Motor haulage; (2) road tar; (3) bitumen and bitumen emulsions; (4) spraying roads with bitumen and bitumen emulsions; (5) ready-mixed concrete; (6) tools and general stores; (7) gulley gratings, weirs and manhole covers; (8) traffic signs; (9) concrete paving slabs, kerbs, pipes, blocks, fence posts and sand; (10) bricks and salt glazed ware pipes and gullies; (11) Portland cement; (12) fuel oils, buring oils and vaporising oils; (13) rubber tyres and tubes, tyre remoulds and batteries; (14) adhesion additives for use in tar and bitumen; (15) weed-killer; (16) hedge trimming; (17) plastic white line composition. Documents from the County Surveyor, County Hall, Truro. Tenders by January 8.

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Coventry.—Supply of the following during period March 1, 1962 to February 28, 1963, for City Corporation: Tools; holloware; builders' and general ironmongery. Documents from City Engineer, Council House, Coventry. Tenders by January 11.

Denbighshire.—Supply of the following in respect of the year ending March 31, 1963, for C.C.: Road making materials—Pitching stone, dry macadam, chippings and dust, wetmix, and leanmix concrete, tarred and bitumenised macadam, dense tar mixture, bituminous and tar macadam and dense tar surfacing laid by mechanical spreaders, crushed gravel and sand, road tar, bitumen, bituminous emulsions in drums and sprayed direct to roads; surface dressing—collection of tar and bitumen to road surfaces. —Binder delivered to pressure sprayer, surface treatment—filled bitumen and preheated chippings; concreting materials and concrete products—cement, concrete tubes, concrete kerbs, paving slabs and fencing posts, ready-mixed concrete and mixer-transporter concrete; hire of haulage and plant— hire of petrol and diesel lorries, low loader hire, hire of tractors for snow clearing, roller hire, hire of tractors for snow clearing, roller hire, hire of miscellaneous plant (excavators, tractor-shovels, bulldozers, trenching machines, etc.), road burner, planer and loader for heating and planning road surfaces, hire of Barber-Greene and Blaw-Knox finishers; materials for surface water drainage—glazed stoneware pipes and agricultural pipes, manhole covers, gulley grids and frames, bricks (common, concrete and engineering); fencing materials—wire mesh fencing, fencing wire and flat mild steel, split oak posts; supply of labour with tools for— laying of plastic white line material (including provision of material), fixing reflecting roadstuds; miscellaneous items— tools and wheelbarrows, rebristling Lacre sweeping brushes, plastic white line material (excluding provision of material), fixing reflecting roadstuds; miscellaneous items— tools and welding equipment, for C.C. Tenders by January 15, \*Durham.—

ct.; (2) angle irons; (3) grass seed; (4) fertilisers. Documents from Superintendent of Playing Fields, 26 Market Place, Durham. Tenders by January 8.

Durham.—Supply of the following requisities and services during the year ending March 31, 1963, for C.C.: (1) Bitumen macadam, tarmacadam, dense tar surfacing materials and dry roadstone; (2) road tar, tar compounds. proprietary compounds, bitumen and cold emulsions; (3) coarse aggregate and fine aggregate (gravel and sand); (4) precast concrete kerbs and concrete flags; (5) precast reinforced concrete fencing and safety posts; (6) portland cement; (7) salt glazed ware pipes and fittings and clawware field drain pipes; (8) concrete pipes; (9) cast-iron gullies, manhole covers and frames; (10) wooden post and rail fences and gates; (11) road traffic signs and bollards; (12) hire of heavy plant, including road rollers and formwork; (13) hire of mechanical haulage; (14) hire of mechanical haulage; (14) hire of mechanical haulage; (14) hire of mechanical haulage for snow-ploughing; (15) ready mixed concrete; (16) hard burnt red shale; (17) fine ashes. Services: (18) land tractors for snow-ploughing; (19) team labour; (20) supply and laying of plastic white lines. Documents from the County Surveyor. Aykley Heads, Durham. Tenders by January 5.

\*Ealing, Middx.—Supply of materials and services for the 12-month period ending on March 31, 1963, for R.D.C.: (a) Concreting aggregate; (b) cements; (c) sanitary fittings and plumbing goods; (d) precast concrete goods; (e) ranges and fireplaces. etc.; (f) electrical goods; (g) manufactured joinery; (h) timber; (i) cast-iron goods; (j) head and nuralite; (a) glass and putty; (r) hired haulage; (s) bituminised macadam, Applications to the Engineer and Survevor. Council Offices, Easinston. Tenders by January 12.

Eastleigh, Hants.—Supply and delivery of the following for the year April 1, 1962, to March 31, 1963, for B.C.: (a) Asphalt; (2) bitumen macadam; (3) bitumen emulsions; (4) clinker and ashes: (5) kerbs and channels. prec

gravel and sand; (8) tarmacadam, limestone; (9) petrol derv, heating oil and paraffin; (10) electric lamps for street lighting; (11) gas mantles for street lighting. Documents from the Borough Engineer and Surveyor, Town Hall, Eastleigh. Tenders by Jan. 13.

the Borough Engineer and Hall, Eastleigh. Tenders by Jan. 13.

\*Epping, Essex.—Supply of materials for U.D.C. Tenders by Jan, 22.

Frimley and Camberley, Surrey.—Supply of Materials. and hire of motor-Frimley and Camberley, Surrey.—Supply of the following materials, and hire of motor-lorries and road-rollers for the financial year ending March 31, 1963, for U.D.C.: Ballast, sand, gravel, shingle and hardcore; bricks; cement; brooms; brushes—rebristling (Lewin road-sweeper); chippings (granite and limestone); tarmacadam and bituminous surfacing; cold asphalt, tar compounds; stoneware; castion goods; bib-and-brace overalls and jackets (blue); paraffin; kerbs, paving slabs and concrete edging; hire of motor-lorries and road-rollers. Documents from the Engineer and Surveyor, Municipal Buildings, London Road. Camberley. Tenders by Jan. 31.

\*\*Greenwich.—Materials for B.C. Tenders

\*Greenwich.-Materials for B.C. Tenders by Jan. 17.
\*Grimsby, Lines.—Supply of materials for

Grimsby, Lines.—Supply of materials for B.C. Tenders by Jan. 31.

Hebburn, Dur.—One hundred and two aged persons' one-bedroom bungalows as Hebburn Hall Ponds site—supply of the following, for U.D.C.: (1) Carcassing and dressed timber; (2) joinery (door frames, casings, E.J.M.A. windows, kitchen units, etc.); (3) sanitary ware; (4) general building materials (including hardware, nails, etc.); (5) roofing tiles (15in. x 9in. concrete interlocking); (6) also for the supply and laying of thermoplastic floor tiles. No tender forms will be issued, but schedules of materials may be obtained on application to the Engineer and Surveyor, Council Offices, Argyle Street, Hebburn. Tenders by January 15.

to the Engineer and Surveyor, Council Offices, Argyle Street, Hebburn. Tenders by January 15.

\*Huntingdonshire. — Materials for C.C. Tenders by Jan. 17.

\*Isle of Ely.—Materials and services, for C.C. Tenders by Jan. 17.

\*Kesteven.—Supply of materials for C.C. Tenders by Jan. 15.

Kingston-upon-Thames, Surrey. — Supply of materials on a firm-price basis for 12 months commencing April 1, 1962, for B.C.—(1) Sand: (2) ballast; (3) tarred limestone; (4) cold asphalt; (5) cold coat 55 per cent.; (6) paving stones: (7) concrete kerb; (8) Pine disinfectant. Documents from Borough Surveyor, Guildhall, Kingston-upon-Thames. Tenders by Jan. 12.

Lichtield, Staffs.—Following materials and work for the 12 months ending March 31, 1963, for City Council: (1) Supply of bituminous macadam; (4) petrol and oils; (5) fine cold asphalt for footway works; (6) concrete flags and kerbs; (7) stoneware pipes; (8) concrete pipes; (9) granite chippings and broken stones; (10) Portland cement; (11) solid fuel; (12) ashes and red shale; (13) sand and gravel; (14) protective clothing; (15) cast-iron manhole covers and frames; (16) cast-iron road gulley gratings and frames, Applications accompanied by a stamped addressed envelope, to

ashes and red shale; (13) sand and gravel; (14) protective clothing; (15) cast-iron manhole covers and frames; (16) cast-iron road gulley gratings and frames. Applications accompanied by a stamped addressed envelope, to D. E. Lawrance, City Engineer and Surveyor, Meredith House, 62 Wade Street, Lichfield. Tenders by Jan. 6.

Lindsey.—Supply during the twelve months commencing April 1, 1962, for C.C.: (1) Coated macadam; (2) broken stone and slag, chippings, gravel and sand; (3) refined tar; (4) cold bitumen emulsion; (5) Portland cement; (6) concrete kerbs, channels and flags; (7) stoneware, concrete and concrete porous pipes; (8) tools, implements, etc. Hire of plant:—(9) Steam and diesel rollers; (10) surface dressing (application only). Documents on receipt of a stamped addressed brief envelope, to County Surveyor, County Offices, Lincoln. Tenders by January 8.

Northern Ireland.—Supply of paints to Government Establishments, for Ministry of Finance. Documents from Room 103, Law Courts-Building, Belfast, I. Tenders by Jan. 15.

Peterborough.—Supply of materials for the year ending March 31, 1963, for City Council: Cement; lime; precast granite aggregate concrete kerbs, channels, quadrants and edging kerbs: precast granite aggregate paving slabs: washed gravel; grit; all-in gravel; washed sand; hoggin; stabilised hoggin; ready mixed concrete; tarmacadam; dense tar surfacing; bitumen macadam; sealing orit; limestone pitching, etc.; cold asphalt; hot rolled gravel asphalt; cold bitumen emulsion; plastic white line compound; petrol and gas oil; derv; dustbins; street name plates, Applications to L. H. Robiohn, city engineer and surveyor, Town Hall, Peterborough. Tenders by January 3.

Portsmouth.—Following during the period of 12 months commencing April 1, 1962, for

Town Hall, Peterbology...
January 3.

Portsmouth.—Following during the period of 12 months commencing April 1. 1962, for City Council: Fine cold asphalt; asphalt and bitumen macadam; bitumen macadam; bitumen emulsion; bricks and tiles; castings; cement; concrete (ready mixed); concrete flags; concrete pipes; disinfectant; glass;

granite chippings; gravel, sand, shingle, etc; ironmongery; kerbing and channelling; lime; mastic asphalt channels; reinstatements; stone-ware pipes; street nameplates; tarmacadam; high viscosity tarmacadam. Applications to the Supplies Officer, Central Depot, Eastern Road, Portsmouth. Tenders by January 5, Radciife, Lancs.—Supply and delivery of the following, for the period ending March 31, 1963, for B.C.: (1) Portland cement; (2) concrete flags; (3) concrete edging; (4) stone edging kerb; (5) petrol and dery; (6) tyres; (7) salt; (8) ready mixed concrete; (9) bituminous macadam and wetmix; (10) brush refills for sweeper. Written applications to the Borough Engineer and Surveyor, Town Hall, Radcliffe, Tenders by January 23.

\*Rainford, Lancs.— Road materials for U.D.C. Tenders by Janu. 12.
Rutland.—Supply of the following, for the year ending March 31, 1963, for C.C.: (1) Crushed granite, slag, limestone and pitching; (2) washed and crushed gravel; (3) tarmacadam and dense tar surfacing; (4) bitumen macadam, dense bitumen surfacing and hot rolled asphalt to B.S.594; (5) supplying and laying by Barber-Greene machine, items (3) and (4); (6) bituminous emlusions; (7) supply and application only of tar and/or bitumen for surface dressing; (8) furnace ashes; (9) truck mixed concrete; (10) the laying of plastic white lines and reflecting roadstuds; (11) hire of mechanical haulage; (12) hire of road rollers; (13) heating and planing; (14) the laying of precast concrete haunching; (15) the laying of precast concrete haunching; (16) only may be obtained on application to the County Surveyor, County Offices, Oakham. No forms of tender for items (1), (2), (3), (4), (5), (7), (9), (11), (13), (14), (15), and (16) only may be obtained on application to the County Surveyor, County Offices, Oakham. No forms of tender for items (10), (1

to A. Bond, clerk of the county council, County Offices, Oakham. Tenders by January 15.

\*St. Pancras.—Supply of road materials for B.C. Tenders by Jan. 19.

\*Shrewsbury, Salop.—Annual tenders, for B.C. Tenders by January 15.

Stoke-on-Trent, Staffs.—Supply of approximately 700 tons, ex-works, of best hand-picked lump lime and 250 Tygan plastic press cloths (No. 5092) for use at the several purification works during the financial year 1962-1963, for City Council. Documents from the office of the City Sewage Engineer, Leek Road, Stoke-on-Trent. Tenders by Jan. 24.

\*Swansea.—Supply of materials and haulage, for B.C. Tenders by Jan. 24.

\*Tunbridge Wells, Kent.—Following for a period of 12 months from April 1, 1962, for B.C.: Road construction materials; surface dressing materials; lubricating and fuel oils; ironmongery, etc.; workmen's overalls; cleaning materials (soap, etc. disinfectant fluid and powder): sand and ballast; concrete tubes; water tubing and fittings Documents from the Borough Surveyor, Town Hall, Tunbridge Wells, Tenders by January 15.

Wakefield, Yorks.—Supply of the undermentioned during the year ending March 31. 1963, for City Council: (1) Cement; (2) cold asphalt and cold emulsion; (3) dustbins; (4) haulage; (5) heating and planning of carriageways; (6) petrol and diesel oil; (7) precast concrete kerbs and flags; (8) sand, gravel and roadstone chippings; (9) surface dressing of carriageways; (10) tarmacadam and bituminous macadam. Applications to the City Engineer, Town Hall, Wakefield, Tenders by January 23.

\*Wigan, Lancs.—Supply of materials, for B.C. Tenders by Jan. 6.

#### PLANT AND MECHANICAL TRANSPORT

PLANT AND MECHANICAL TRANSPORT
Belfast.—Supply and delivery of the following for City Council: (a) Hi-lift loading shovel; (b) two-way loading shovel; (c) 7/10cwt motor van; (d) vibrating roller, and (e) 2-ton crane. Documents from City Surveyor's Department, Room 84, City Hall. Belfast. 1. Tenders by Jan. 8.

Cardiff.—Supply, delivery and erection of a self-contained 30-ton weighbridge and indicator at the Water Treatment Works to be built at Sluvad, Panteg, near Pontypool, Monmouthshire. for City Council. Documents from the Engineer, Engineer's Office. Cardiff Corporation Waterworks. Llandegfedd Water Scheme—Section "B". Sluvad. Panteg, near Pontypool. Monmouthshire. Tenders by January 16. Haltemprice, Yorks.—Supply of one street lighting vehicle fitted with a Simon L25 hydraulic platform, for U.D.C. Documents from the Engineer and Surveyor. Anlaby House. Anlaby. Tenders by Dec. 29.

Hemel Hemostead, Herts.—Supply and and delivery of a 2-ton tipping truck, and a vibrating roller or compactor, for B.C. Documents from A. H. Turner, borough engineer, High Street, Hemel Hempstead. Tenders by Jan. 8.

Heston and Isleworth, Middx.—Supply and delivery of two Bedford L.W.B. 15cwt. vans.

for B.C. Documents from the Borough Engineer and Surveyor, 88 Lampton Road, Hounslow Tenders by January I.

Manchester.—Supply of one Clayton steam genera.or, model RO15, for City Council. Document from the City Surveyor, Town Hall, Manchester, 2. Tenders by Jan. 2.

Norfolk.—Supply one Dinkum 60 excavatorité 66 power shoyel and other equipment.

genera.or, model RO15, for City Council. Document from the City Surveyor, Town Hall, Manchester, 2. Tenders by Jan. 2.

Norfolk.—Supply one Dinkum 60 excavator with 66 power shovel and other equipment, for C.C. Applications to the County Surveyor, County Offices, Thorpe Road, Norwich, Norfolk, NOR 47A. Tenders by Jan. 5.

North Down.—Supply of two small concrete mixers, for R.D.C. Documents from Council Offices, 2 Church Street, Newtownards. Tenders by Jan. 2.

Oidham, Lancs.—Supply of an Atlas-Copco NT9 compressor unit capable of delivering 110 cu. ft. free air per minute, and mounted on, and including, a standard industrial diesel fordson Super Major tractor, for B.C. Alternative tenders are also invited for the supply of the above plant in part exchange for a 1949 Atlas-Copco trailer compressor, which may be inspected at any time during normal working hours at the Highways Depot, Gas Street, Oldham. Tenders in a plain sealed envelope endorsed "Tractor Compressor," to the Chairman of the Surveyor's and Buildings Committee, 75 Union Street, Oldham, by January 2.

Slough, Bucks.—Supply and delivery of one Karrier twin-cab lorry for B.C. Allowance should be included for a Karrier lorry, which must be taken in part exchange and may be inspected by arrangement. Documents from the Borough Engineer, Town Hall, Slough. Tenders by Jan. 2.

Saffordshire.—Supply of the following, for Co. E.C.: (a) Three Ferguson diesel tractors, fitted with all weather cabs and appropriate towing hitch; (b) three Hargreaves "Sisis" implement trailers, 40cwt. capacity; (c) three sets Lloyds Leda Quintuple, 30in, gang mower units, with towing and coupling frames. Documents from the Director of Education (P.F.), Education Office, Earl Street, Stafford, Tenders by December 29.

Westmerth, Eire.—Supply and delivery to the machinery yard at Mullingar of the following, for C.C. One diesel bulldozer within the range of 40/80 drawbar H.P., and not less than 13,0001b. D.B. pull at approximately 1,600 r.m. to be fitted with angle dosing blade, win

#### PLAYING FIELDS, PARKS, ETC.

PLAYING FIELDS, PARKS, ETC.

\*Bristol.—Reconstruction of tennis courts for City Council. Tenders by Jan. 17.

Gateshead, Dur.—Levelling, filling of mine shaft, soiling cultivation and seeding of approximately 21 acres of playing fields, at Whitehouse Lane, for B.C., including drainage, water supply, fencing, car park, and ancillary work. Documents from the Borough Surveyor, Swinburne Street, Gateshead, 8. Deposit £2. Ienders by January 5.

Mangotsfield, Glos.—Bromley Heath playing field, grading, cultivating and seeding five acres of playing field and other works including the symng of land drains and the construction of mbble walls, for U.D.C. Documents from the fogineer and Surveyor, Council Offices, 26. South View, Staple Hill, Bristol. Deposit £2 2s. Ienders by Jan. 1.

Merton and Morden, Surrey.—Construction of a bowling green, including underdrainage.

of a bowling green, including underdrainage and incidental work, at John Innes Park, Mostyn Road, S.W.19, for U.D.C. Applications to the Engineer and Surveyor, Morden Hall, S.W.19. Tenders by January 1.

# RIVER AND FLOOD PREVENTION WORKS

West Sussex.—Construction of a wave screen at Felpham, near Bognor Regis, for River Board, The works consist of the construction of 175 lin. ft, of timber screening in 10in. by long reenheart piles and jarrah palings with double greenheart walings, in front of the eastern end of the Felpham Sea Wall. Documents from the Chief Engineer of the Board, County Hall, Chichester. Deposit £2 2s. Tenders by January 4.

ROADS, BRIDGES AND SITE WORKS

Ashton-under-Lyne, Lancs.—Work of private reet improvement, comprising draining, Ashton-under-Lyne, Lancs.—Work of private street improvement, comprising draining, metalling, flagging, etc. Total length approximately 180yd., in two streets, for B.C. Documents from Charles J. Lomax and Son, chartered civil engineers, 68 Barton Arcade, Deansgate, Manchesser, J. Tenders by Jan. 9.

Baildon, Yorks.—Making up Fernbank Drive and Glenaire Drive, for U.D.C. Documents from the Surveyor, Town Hall, Baildon. Tenders by January 15.

"Barnes.—Road works, for B.C. Tenders by January 9.

Bath.—Reconstruction and widening of approximately 1,300 lin. yd, of carriageway and footpaths, and appurtenant works, including drainage, at Pennyquick, for City Council. Documents from Office of the City and Waterworks Engineer, Guildhall, Bath. Deposit £2 2s.

Tenders by January 1.

Beddington and Wallington, Surrey.—About 5,000 sq. yd. of road surfacing to B.S.594, or its equivalent, inclusive of incidental works, for B.C. Applications to the Borough Engineer, Town Hall, Wallington, by December 30. The work must be carried out before gineer, Town Hall, Wallington, by December 30. The work must be carried out before March 31, 1962, with a possible similar area

to follow.
\*Bedfordshire.—Making-up of new road,
Bromham, for C.C. Deposit £2. Tenders by

Jan. 11.

Birmingham.—Construction of carriageways and footways in Lee Bank redevelopment area, units 314, 315 and 322, for City Council. Documents from the Office of Sir Herbert J. Manzoni, city engineer and surveyor, Baskerville House, Civic Centre, Birmingham 1. Deposit £2 2s. Tenders by January 3.

Birmingham.—Widening of Hurst Street, for City Council. Documents from the Office of Sir Herbert J. Manzoni, city engineer and surveyor, Baskerville House, Civic Centre, Birmingham. Deposit £2 2s. cheque. Tenders by January 3.

Brighton, Sussex.—Construction of

veyor, Baskerville House, Civic Centre, Birmingham. Deposit £2 2s, cheque. Tenders by January 3.

Brighton, Sussex.—Construction of a carpark including the following works: Kerbing, path edging, tarmacadam paving, soakaway and gully connection at Woodingdean Branch Library and Community Centre, for B.C. Documents from D. J. Howe, borough surveyor, 26-30, King's Road, Brighton. Tenders by Jan. 1.

Bristol.—Extension of apron in front of terminal building at Lulsgate Airport, Somerset, for City Council. Work consists of providing hardcore formation with bitumen macadam surfacing for approximately 13,000 sq. yd., including drainage and other ancillary works. Documents from City Engineer and Planning Officer, Cabot House, Deanery Road, Bristol. Tenders by Jan. 11.

\*Bury St. Edmunds, Suffolk.—Roads and sewers at Westley estate, contract 4, for B.C. Deposit £2 2s. Tenders by Jan. 5.

\*Cambridgeshire. — Hot rolled contract 6120, for C.C. Tenders by Jan. 8.

\*Carlisle, Cumb.—Various works at airport, for City Council. Tenders by Jan. 5.

\*Caterham and Warlingham, Surrey.—Surfacing of Buxton Lane, Caterham, for U.D.C. Tenders by Jan. 8.

Cheadle and Gatley, Ches.—Making up of Thornfield Grove, Cheadle Hulme, for U.D.C. Applications to the Engineer and Surveyor, Town Hall, Cheadle, Deposit £2 2s. Tenders by January 8.

\*Coulsdon and Purley, Surrey.—Various contracts for U.D.C.

Applications to the Engineer and Surveyor. Town Hall, Cheadle. Deposit £2 2s. Tenders by January 8.

\*Coulsdon and Purley, Surrey. — Various roadworks for U.D.C. Deposit £3 3s. each. Tenders by Jan. 9.

\*Dartford, Kent.—Surfacing of roads, etc., for B.C. Deposit £2 2s. Tenders by Jan. 16.

\*Derbyshire. — Road improvement at Borrowash Road, Spondon, for C.C. Deposit £5. Tenders by Jan. 22.

\*Doncaster, Yorks.—Improvement of Balby Road, A.60, for B.C. Deposit £3 3s. Tenders by Jan. 15.

Esher, Surrey.—Resurfacing of carriageway in hot rolled asphalt—Portsmouth Road (A.307), Thames Ditton, contract 329, for U.D.C., involving heating and planning existing road surface, and laying by machine hot rolled asphalt surfacing to a thickness of 2in. The extent of the work amounts to approximately 8.000 sq. yd., and includes for raising of manhole covers, etc., to new levels, and the provision of a pedestrian crossing in mastic asphalt. Documents from the Engineer and Surveyor and Planning Offices, Council Offices, High Street, Esher. Deposit £1 ls. Tenders by January 5.

\*Exeter.—Inner By-pass—stage VA, for City Council. Denosit £2 2s. Tenders by Jan. 18.

January 5.

\*Exeter.—Inner By-pass—stage VA, for City Council. Deposit £2 2s. Tenders by Jan. 18.

\*Glamorgan.—Private street works (1) and (1) for C.C. Deposit £3 each. Tenders by Jan. 12.

(2), for C.C. Deposit 2. Caching Jan. 12.

Gosport, Hants.—Making-up of eight private streets for B.C., involving the replacement of broken kerbs; the laying of approximately 750 lin. yd. of 6in. diameter pipes in gully connections and sewer extensions; the construction of 12 manholes and 38 road gullies and the laying of 12,000 sq. yd. of hot rolled

asphalt road surfacing and 6,800 sq. yd. of asphalt footways together with appurtenant works. Documents from the Borough Engineer, The Hall. Trinity Green, Gosport. Deposit

asphalt footways together works. Documents from the Borough Engineer, The Hall, Trinity Green, Gosport. Deposit £2 2s. Tenders by Dec. 28.

Grantham, Lines. — Making-up of part of Bridge End Grove for B.C. Documents from the Borough Surveyor, Guildhall, Grantham. Tenders by Jan. 1.

\*Herne Bay, Kent.—Contracts 1 and 2 at Roselea Avenue, for U.D.C. Tenders by Ian. 6.

Jan. 6. Herifordshire.—Following for C.C. Rowley Lane, Elstree, C.86—Road improvement works on two bends north of junction with Elstree Way. The works comprise site clearance, 2,500 cu, yd. excavation, 2,000 sq. yd. carriageway surfacing; 74 lin. yd. 6in. diameter surface water drain, 320 lin. yd. of ditching, and 280yd. of fencing. Documents from the Office of the County Surveyor, County Hall, Hertford. Tenders by January 17.

\*Leatherhead, Surrey.—Regrading and resurfacing work, for U.D.C. Tenders by January 27.

\*Leeds.—Soil investigation for City Council.

\*\*Leatherhead, Surrey.—Regrading and resurfacing work, for U.D.C. Tenders by January 27.

\*\*Leeds.—Soil investigation for City Council. Deposit £1. Tenders by Feb. 1.

Leicestershire.—Reconstruction of Sibson Bridge, A.444 and approximately 700yd, of approach carriageway, for C.C. Documents from the County Engineer and Surveyor, County Offices, Grey Frars, Leicester. Deposit £5. Tenders by January 25.

Leigh, Lancs.—Making-up of Beech Drive and the construction of 9in. sewers therein, for B.C., comprising approximately 150yd, of street works and 40yd, of sewers. Documents from the Borough Engineer and Surveyor, Town Hall, Leigh. Deposit £2 2s. Tenders by January 19.

Leominster and Wigmore, Heres.—Site preparation works for 27 dwellings at Steens Bridge for R.D.C., comprising demolitions, the construction of roads, footpaths, sewers, sewage disposal works, water pump house and the laying of water mains. Documents from S. N. Shrimpton and Son, chartered architects, 54 Broad Street, Ludlow, Salop. Deposit £5 5s. Tenders by Jan. 4.

Lichfield, Staffs.—Contract 212, completion works to access road off Rugeley Road, Chase Terrace, for R.D.C., the approximate quantities being as follows: 300 cu. yd. of excavation, 850 sq. yd. of road construction (9in. broken stone, tarmacadam and cold asphalt) and ancillary works. Documents from the Clerk to the Council, Rural Council House, Lichfield. Deposit £2 2s. Tenders by Jan. 11.

Lymington, Hants.—Making up Carrington Lane, Lawn Road, Park Road, and Park Close, for B.C. Documents from the Office of the Borough Engineer, Town Hall, Lymington. Deposit £2 2s. Tenders by January 4.

\*\*Maidenhead, Berks, — Construction of Hibbert Road Bridge, for Thames Conservancy Board.

Newcastle-under-Lyme, Staffs.— Completion works to road and footpaths at the following.

\*Maidenhead, Berks. — Construction of Hibbert Road Bridge, for Thames Conservancy Board.

Newastle-under-Lyme, Staffs. — Completion works to road and footpaths at the following, for B.C.: (a) Knype Close, Knype Way, Bradwell; (b) The Hollies, Hempstallslane. Applications in writing to C. J. Morton, town clerk, High Street, Newcastle, by December 31. Tenders by January 22.

Orpington, Kent.—Making up of Shepperton Road (part of), Petts Wood, the length of which is approximately 115 lin. yd., for U.D.C. The works consist of providing and laying slab-paved footways and kerbing, re-laying existing paving and kerbing, and minor works to existing concrete carriageway. Documents from L. W. Freeman, engineer and surveyor, Civic Offices, The Walnuts, High Street, Orpington. Tenders by December 28.

Ramsbottom, Lancs.—Blackburn Road and Bolton Road West. Laying of approximately 12,000 super. yd. of hot rolled asphalt, for U.D.C. Applications to the Engineer and Surveyor, Council Offices, Ramsbottom, Via Bury. Tenders by January 10.

Rayleigh, Essex. — Making-up of Nelson Road (North), by the construction of approximately 215 lin. yd. of 16ft. wide reinforced concrete carriageway, slab-paved footways, seeded grass verges, and ancillary works of street lighting and surface water drainage, for U.D.C. Documents from the Offices of the Engineer and Surveyor, Council Offices. Hockley Road, Rayleigh. Tenders by Jan. 1.

Rayleigh, Essex.—Construction of approximately 5,000 sq. yd. of hardcore and tarmacadam hardstanding, and access roads, at Castle Road car park, for U.D.C., together with incidental works of lighting, surface water drainage, and provision of footways, Documents from the Offices of the Engineer and Surveyor, Council Offices. Hockley Road, Rayleigh. Tenders by Jan. 18.

\*Reading, Berks.—Construction of footways and verges, for B.C. Tenders by Jan. 18.

\*Reigate, Surrev.—Kerbing and footpath works, A.23, for B.C. Tenders by Jan. 10.

Richmond, Surrey.—Supply and erection of traffic signs, including external lightin

lanterns, consisting of approximately 35 advance direction and 35 local direction signs, for B.C. Documents from the Borough Engineer and Surveyor, Kin's Road, Richmond. Tenders by Jan. 1.

Rochdale, Lancs. — Private improvement works at Stanhope Street, Clara Street, Hastings Street, St. Lukes Street, Clifford Street and Bentley Street, for B.C. Documents from Borough Surveyor, Town Hall, Rochdale. Tenders by January 15.

Ross and Cromarty.—Construction of a new bridge and roadworks near Camusluanie, South West Ross, for C.C. Documents from James Arrol, county surveyor, 84 High Street, Dingwall. Deposit £5 cheque. Tenders by January 9.

\*Salford Lancs.—Siteworks for garages for

wall. Deposit £5 cheque. Tengers by January 9.

\*Salford, Lancs.—Siteworks for garages, for City Council. Tenders by Jan. 8.

Sittingbourne and Milton, Kent.—Asphalt surfacing contract 1961-62, for U.D.C., including laying approximately 4,150 sq. yd. of 4in. cold asphalt wearing course and approximately 720 sq. yd. of 4in, bituminous macadam wearing course and adjusting manhole covers, etc., to new levels. Documents from the Engineer and Surveyor, Lydbrook, 89 London Road, Sittingbourne. Deposit £3 3s. Tenders by January 8.

January 8.

Southport, Lancs.—Surfacing of approximately 8,090 sq. yd. of Scarisbrick New Road with a lin. carpet of hot rolled asphalt, for B.C. Documents from the Borough Engineer, Town Hall, Southport, Deposit £2 2s. Tenders by January 5.

Stocknort, Ches.—Construction of lay-bys—

Town Hall, Southport. Deposit £2 2s. Tenders by January 5.

Stockport, Ches.—Construction of lay-bys—Stockport Road, Heaton Moor Road, Penshurst Road and construction of footpath at Meadows Road, for B.C., including approximately 480 sq. yd, of 8in. r.c. slab, and various kerbing and flagging works. Documents from Room 76, Town Hall, Stockport. Tenders by January 15.

\*Stoke-on-Trent, Staffs.—Street works, contact 3, for City Council. Deposit £2. Tenders by Jan. 3.

Stourbridge. Worcs.—Making up of Valley

by Jan. 3.

Stourbridge, Worcs.—Making up of Valley Road, for B.C., consisting of surface excavation and approximately 300 lin. yd, kerb and channel, 900 sq. yd, bituminous macadam carriageway with wet-mix foundation on ash base, asphalt footpaths, 134 lin. yd, of 9in. diameter and 6in. diameter stormwater sewer, together with incidental works. Documents from H. W. Morris, borough engineer and surveyor, Council House, Stourbridge. Deposit £2 2s. Tenders by January 5.

\*Surrev.—Widening Sutton By-pass, for

engineer and surveyor, Council House, Stourbridge. Deposit £2 2s. Tenders by January 5.

\*Surrey. — Widening Sutton By-pass, for C.C. Tenders by Jan. 13.

Surrey. — Following for C.C.: Haunching, kerbing, drainage and footway works with bituminous macadam base courses at Woking Road (Station Road, B.383) — approximately 450 lin. yd., Red Lion Lane—approximately 250 lin yd., and Fellow Green Road—approximately 500 lin. yd., at Chobham. Documents from County Engineer, County Hall, Kingston-upon-Thames. Tenders by Jan. 6.

Thornaby-on-Tees, Yorks.—Making-up of three roads and six back streets, for B.C. The works include approximately 1,200 sq. yd. of new carriageway with leanmix concrete foundation and bituminous macadam surfacing, together with other ancillary works. Documents from the Borough Engineer's Office, Town Hall, Thornaby-on-Tees, Deposit £2 2s. Tenders by January 8.

Wantage, Berks. — Manor Road private street works, for U.D.C., including the construction of approximately 896 sq. yd. of flexible carriageway with lean-mix concrete base and 334 sq. yd. of footpath in tarmacadam and fine cold asphalt together with incidental works. Documents from the Surveyor, Council Offices, Portway, Wantage. Tenders by January 3.

Watford, Herts.—Execution of road main-

works, Documents from the Surveyor, Council Offices, Portway, Wantage. Tenders by January 3.

Watford, Herts.—Execution of road maintenance works for the period of nine months commencing on April 1, 1962, for B.C. Applications to F. C. Sage, borough engineer and surveyor, Town Hall, Watford, by 2 p.m. January 4.

Weston-super-Mare, Som.—Baytree Road improvement for B.C. The work includes approximately 1,750 cu. yd. of excavation largely in rock and hard ground, surface water drainage, 2,000 sq. yd. of hot rolled asphalt carriageway construction, together with kerbing, footway works and 250 sq. yd. of stone walling. Documents from the Borough Engineer's Office. Town Hall, Weston-super-Mare. Deposit £2 2s. Tenders by Jan. 1.

West Riding.—Following bridge painting contracts, for C.C.: (1) Glasshouses Bridge, Pateley Bridge; (2) Pinder Canal, Unicorn. Skipton; (3) Woodhall, Wetherby; (4) Greys, Mexborough; (5) Tilts Hill, Doncaster; (6) Sprotborough River, Sprotborough Canal, Doncaster; (7) Stainforth Footbridge, Thorne; (8) Treeton Footbridge, Catcliffe, Parkgate Canal, Rotherham; (9) Dutch River, Goole; (10) Thurlstone, Penistone; (11) Hopton New, Mirfield; (12) Brighouse, Brighouse.

ments from the County Engineer and Surveyor, County Hall, Wakefield, Deposit £1 each. Tenders by January 15.

West Suffolk.—Construction of a new bridge over the River Stour, near Blunts Hall, Little Wratting, to carry the A.143, Bury St. Edmunds-Haverhill Road, for C.C. The work consists of a 30ft. span bridge with composite deck of prestressed beams and in-situ concrete on mass concrete abutments, together with approximately 400 lin. yd. of approaches, fencing and other ancillary works, Documents from the County Surveyor, Manor House, Bury St. Edmunds Deposit £5. Tenders by January 15.

West Sussex.— London-Worthing Road (A.24), construction of Horsham By-pass Road, for C.C., involving the construction of three miles of dual carriageway, three major roundabouts, two medium span bridges and ancillary works. Applications to the County Surveyor, County Hall, Chichester, by noon December 29.

Wilmslow, Ches.—Private street works,

works. Applications to the County Surveyor, County Hall, Chichester, by noon December 29.

Wilmslow, Ches.—Private street works, Wallingford Road Group, for U.D.C., comprising approximately 570 lin. yd. of kerbing and channelling, 1,750 super. yd. of carriageway reshaping and surfacing, together with footway and appurtenant works. Documents from the office of the Engineer and Surveyor, Council Offices, Green Hall, Wilmslow Deposit £2 2s. Tenders bw January 15.

Wittshire.—Flame cleaning and repainting of approximately 625 sq. yd. of steel troughing forming the underside of the deck to Calne Town Bridge, for C.C. Documents from the County Surveyor, County Hall, Trowbridge. Tenders by Jan. 2.

Wortley, Yorks.—Completion of Greno Crescent, Grenoside, for R.D.C., including kerbing, surfacing of carriageway and paths, and sundry incidental works to complete about 68 lin. yd. of this 36ft. wide street. Documents from Arthur Wikeley, Council Offices, Grenoside, Sheffield. Tenders by Dec. 29.

"Wrexham, Denbighs.—Access road and foundation slab to garages, for B.C. Deposit £2 2s. Tenders by January 8.

"York.—Making-up Oakland Avenue, for City Council. Deposit £2. Tenders by Jan. 9.

# SEWERAGE, SEWAGE AND REFUSE DISPOSAL

SEWERAGE, SEWAGE AND REFUSE DISPOSAL

Airdrie, Lanarks.—Duplication of south outfall sewer, for B.C., including the laying of 1,265 yds. of reinforced concrete pipe sewer varying in diameter from 27in. to 39in., 6yd. of 33in. steel pipe and 16yd. of 39in. diameter steel pipe on pier and incidental works. Applications together with particulars of experience in the class of work involved, to Crouch and Hogg, consulting engineers, 18 Woodside Crescent, Glasgow, C.3, by Jan. 10.

Bath.—Larkhall and District Flood Relief Scheme, Lower Swainswick relief sewer, for City Council, including laying approximately 600yd. of 9in., 12in. and 18in. sewers, together with nine manholes, and other incidental works. Documents from the City and Waterworks Engineer, Guildhall, Bath. Deposit £2 2s. Tenders by January 1.

\*Bridgnorth, Salop.—Aveley sewerage and sewage disposal, for R.D.C. Deposit £5 5s. Tenders by February 9.

Cheadle, Staffs.—Following, for R.D.C.: (a) Alton sewerage and sewage purification scheme (contract 327); (b) Alton Royal Oak, surface water scheme (contract 328), comprising; (a) The laying of approximately 142 lin. yd. 4in. diameter c.i. pipes, 273 lin. yd. 9in. diameter c.i. pipes, 12 lin. yd. 12in. diameter c.i. pipes, 3075 lin. yd. 6in. diameter g.s.w. pipes, 97 lin. yd. 12in. diameter g.s.w. pipes, 90 lin. yd. 9in. diameter g.s.w. pipes, 84 manholes, one storm overflow manhole, two pump houses and ancillary house connections. The sewage works comprise of two detritus tanks, two reinforced concrete 19in. by 6in. diameter sedimentation tanks, two bacteria beds, two humus tanks, six sludge beds one pump house, mains and manholes and ancillary works; (b) the laying of approximately 291 lin. yd. 024in. diameter reinforced concrete surface water sewer, six manholes, one outfall apron, etc. Documents from the Engineer and Surveyor, Council Offices, Leek Road. Cheadle. Deposit £5. Tenders by Jan. 16.

Esher, Surrey.—Construction of surface water sewer, Hurst Road (B.370), West Molesey, contract 328, for U.D.C., c

Halstead, Essex. — Construction of about 450yd. 6in. glazed stoneware pipe sewer and manholes, and a sewage disposal works and incidental works at The Moat, in the Parish of Birdbrook, for R.D.C. Documents from the Engineer and Surveyor, Council Offices, Mount Hill, Halstead. Tenders by Jan. 22 "Havant and Waterloo, Hants.—Construction of foul sewers at Western Parade, for U.D.C. Tenders by Jan. 11.

Hornchurch, Essex.—Land drainage works—Haynes Park, Hall Lane miniature golf course and Fleet Close play space, comprising the following, for U.D.C. Excavation for, and provision of, approximately 300 lin, yd. of 6in. and 450 lin. yd. of 4in. land drains, together with the levelling of land in Fleet Close play space, and other ancillary works. Documents from the Office of the Engineer and Surveyor, Council Offices, Billet Lane, Hornchurch Deposit £2 2s. Tenders by January 15.

and Surveyor, Council Offices, Billet Lane, Hornchurch Deposit £2 2s. Tenders by January 15.

Huyton-with-Roby, Lancs, — Construction of the following, for U.D.C.: (a) One sludge drying bed; (b) pipework and valves; (c) concrete roads. At the Council's Sewage Disposal Works, Tarbook. Documents from the Engineer and Surveyor, Council Offices, Derby Road, Huyton. Tenders by December 29.

\*Kettering, Northants.—Stoke Albany and Wilbarston Main Drainage, for R.D.C. Deposit £5 5s. Tenders by January 26.

Leatherhead, Surrey.—Laying approximately 350yd, of 12in. soil sewer in Cock Lane, Fetcham, for U.D.C. Documents from the Engineer and Surveyor's Department, Red House. Leatherhead, Tenders by December 28.

\*Leicester.—Construction of Wanlip sewage disposal works for City Council. Deposit £10 10s. Tenders by Jan. 26.

Leigh, Lancs.—Provision and construction of 382yd. of 27in. stormwater overflow together with manholes and other attendant works, at Victoria Street, for B.C. Documents from the Borough Engineer and Surveyor, Town Hall, Leigh. Deposit £2 2s Tenders by January 19.

Long Eaton, Derbys.—Supply and erection of pumping machinery and all ancillary gear to replace existing machinery at Old Sawley Pumping Station, for U.D.C. Pumps to deliver 700 gallons per minute when working together. Documents from Francis Turner, engineer and surveyor, Town Hall, Long Eaton. Tenders by January 19.

\*Lunesdale, Lancs.—Alterations and extension of septic tank, Melling, for R.D.C. Documents from the Clerk Council. Officer.

Tenders by January 26.

\*Ludlow, Salop.—Sewerage and sewage disposal works, for B.C. Tenders by January 1.

Lunesdale, Lancs.—Alterations and extension of septic tank, Melling, for R.D.C. Documents from the Clerk, Council Offices, Hornby. Tenders by Jan. 5.

Newport Pagnell, Bucks.—Laying of about 6,000yd, of 9in. and 6in. diameter sewers, together with house connections and manholes, and the construction of a joint sewage disposal works to serve the villages of Ravenstone and Stoke Goldington, for R.D.C. Documents from Pick, Everard, Keay and Gimson, engineers, 6 Millstone Lane, Leicester, after December 28. Deposit £5 5s. Plans also seen at Council Offices, 7 Station Road, Newport Pagnell. Tenders by January 23.

Newtownards, Down.—Following works, for B.C.: The construction of approximately 325yd. of 12in. diameter sewer; 35yd, of 18in. diameter sewer, all of concrete pipe with flexible joints, together with manholes and storm overflows from R. Ferguson and S. McIlveen, consuling engineers, 15 College Gardens, Belfast 9. Deposit £3 3s. Tenders by January 9.

Nottingham. — Construction of approximately 4,600 lin. yd. of sewers from 12/36in. diameter, and 51 manholes, at Beechdale Road, for City Council. Documents from the City Engineer, The Guildhall, Nottingham. Deposit £2. Tenders by Jan. 18.

Ruthin, Denbighs.—Llanbedr Sewerage and Sewage Treatment. Carrying out the works, which comprise the following, for R.D.C. (1) 1,800yd. 6in. diameter sewers complete with manholes; (2) sewage treatment works, comprising sedimentation tank, filters, humstanks, sludge drying beds, access roads, and other ancillary structures; (3) the restoration of surfaces and the maintenance of the completed works for a period of 12 months. Documents from Sir Herbert Humphries and McDonald, consulting engineers, Park Chambers, 276 Monument Road, Edgbaston, Birmingham 16. Deposit £10 10s. cheques payable of R.D.C. Tenders by February 5.

Settle, Yorks.—Construction of one 27tt. diameter percolating filter, humstank, sludge drying beds

Stockbridge, Yorks.—Sewerage and sewage disposal works extensions, contract 2, for U.D.C., including construction of approximately 1,350 lin. yd. of 27in. to 12in. diameter spun concrete pipe sewers, 1,150 lin. yd. of 24in. to 15in. diameter spun iron pipe sewers, concrete tube manholes, brick chambers and sewage pumping station with 80 lin. yd. of 4in. diameter rising main, together with sewage disposal works comprising detritus tanks and recording channels, settling and stormwater tanks, bacterial filters, humus tanks, sludge drying beds, sludge pumping station, mess room and store, and other incidental works. Documents from Willcox, Raikes and Marshall, enginers. 33 Great Charles Street, Birmingham 3. Deposit £15 15s. cheque payable to U.D.C. Tenders by January 31.

Thone, Yorks.—Laying of 2,302ft. of foul sewer and connections in Ellison Street and Southend, for R.D.C. Documents from the begosit £3 3s. cheque. Tenders by January 23.

Tipperary (North Riding), Eire.—Supply and delivery f.o.r. Roscrea, of recording apparatus suitable for measuring the flow of sewage by means of a head on a flume, for C.C. 380-V, 9 cycle, three-phase, A.C. electric power will be available at each site. Documents from Michael O'Sullivan, consulting engineer, 19 Sunday's Well, Cork. Deposit £1 Is. Tenders by Feb. 9.

Tipperary (North Riding), Eire.—Supply and deliver f.o.r. Roscrea and the erection on site at Roscrea of filter distributors suitable for 120ft. internal diameter filter beds, for C.C. Documents from Michael O'Sullivan, consulting engineer, 19 Sunday's Well, Cork. Deposit £1 Is. Tenders by Feb. 9.

Tipperary (North Riding), Eire.—The construction of a disposal works for the town of Roscrea and the lequing of new sewers, for C.C. The approximate length of sewers to be laid are as follows: 358 lin. yd. of 24in. precast concrete pipe; 156 lin. yd. of 18in. precast concrete pipe; 166 lin. yd. of 18in. cast-iron pipe; 40 film. cast-iron pipe; 109 lin. yd. of 6in. cast-iron pipe; 109 lin. yd. of 6in. cast-iron pipe; 109 l

Feb. 9.

Tipperary (North Riding), Eire.—Supply and divery f.o.r. Roscrea of rotary scrapers for wage settling tanks, for C.C. 380-V, 50 cle, three-phase, A.C. electric power will be mailable at the site. Documents from Michael Sullivan, consulting engineer, 39 Sunday's ell, Cork. Deposit £1 ls. Tenders by the consulting supplies the consul 0'Sullivan

O'Sullivan, consulting engineer, 39 Sunday's Well, Cork. Deposit £1 ls. Tenders by Feb. 9.

Tipperary (North Riding), Eire.—Supply and delivery f.o.r. Roscrea, and the erection in the pumphouse at Roscrea of pumps and motors for C.C. The plant shall consist of the following: (a) Three vertical shaft fullway centrifugal pumps each capable of delivering 430 gpm. through an 8in. cast-iron rising main 150ft. long. Three-phase, A.C. electric power will be available at each site where pumps will be located. Documents from Michael O'Sullivan, consulting engineer, 39 Sunday's Well, Cork. Deposit £5 5s. Tenders by Feb. 9.

Whitstable, Kent.—Repairs to harbour culvert, for U.D.C., consisting of sleeving a 48in. diameter cast-iron culvert with a 36in. diameter steel pipe approximately 38ft. long. and all ancillary works relating thereto. Documents from the Engineer and Surveyor, The Castle, Whitstable. Tenders by January 4.

Winchester, Hants.—Sewerage contract 5, Bursledon sewerage scheme for R.D.C. cheluding the construction of about 7½ miles of 6in. to 15in. concrete, glazed stoneware, abestos and steel sewers; about one mile of 5in to 9in. spun-iron pumping mains; four pumping stations, and a sewage disposal works for a population of 4,000 persons, Documents from the offices of Lemon and Blizard, consulting engineers, Telford House, Hulse Road, Southampton, after January 1. Deposit £5 5s., theque payable to R.D.C. Tenders by February 8.

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#### STREET LIGHTING

STREET LIGHTING

Cannock, Staffs,—Supply and erection of the following group "A" lighting units, for U.D.C.: (a) Beecroft Road and College Road—for the station—12 St. mounting height; (b) has station—12 240-W fluorescent lighting mits, including three double units on steel columns, 25ft. mounting height. Documents from the engineer and surveyor, Council flouse, The Green, Cannock, Deposit £2 2s. Tenders by January 2.

Downpatrick, Down.—Supply and erection of approximately 951 street lamps consisting of intermediate and group B fluorescent lighting, for R.D.C. Documents from the Clerk.

Rural District Council, Quoile Road, Downpatrick. Tenders by Jan. 5.

Huntingdonshire. — Illumination of roundabout — Buckden By-pass, A.I, for C.C., including the supply and erection of 12 steel lighting columns with fittings and control gear at the roundabout to be constructed at the southern end of the Buckden By-pass. Documents from the County Surveyor, Walden House, Huntingdon. Deposit £2. Tenders by Jan. 17.

ments from the County Surveyor, watter House, Huntingdon. Deposit £2. Tenders by Jan. 17.

Newmarket, Suffolk.—Supply and erection of 16 fluorescent lamps on 25ft. mounting height steel columns, for U.D.C. Documents from the office of the Engineer and Surveyor Severals House, Newmarket. Deposit £2 2s. Tenders by January 11.

Newport, Mon.—Erection and painting of steel lamp columns and the provision and setting into operation of a system of sodium lighting units in Caerleon Road and Mendalgief Road, for B.C. Documents from the Offices of the Borough Engineer, Civic Centre, Newport. Deposit £2 2s. payable to Borough Treasurer. Tenders by January 1.

\*Peterlee, Dur. — Street lighting, for Development Corporation. Tenders by Jan. 8.

Wellington, Salop.—Supply of concrete columns, lanterns and equipment, for U.D.C. Documents from the Engineer and Surveyor, 14 Walker Street, Wellington. Tenders by January 8.

#### INTERNATIONAL CONTRACT

Madras, India.—Supply and erection of one swing footbridge across the entrance to the New West Dock, 145ft, span, enquiry C<sub>1</sub>13819/59/EP, for Port Trust, Documents from the Deputy Chief Accounts Officer (Engineering), Chief Engineer's Office, Madras Port Trust, Madras, India, on payment oi Rs. 40/-, i.e. £3 per set. The cost of the tender documents will not be refunded. Tenders are to be returned direct to the Chief Engineer, Madras Port Trust, Madras, India, so as to reach him by 2.30 p.m. on February 20 Only the manufacturers (including their constituents or associates authorised to commit them) or their accredited agents who are in a position to supply the requirements from their own or their principal's manufacturers are invited to quote. Specimen copy of the above inquiry can be seen at India Store Department, Government Building, Bromyard Avenue, Acton, London, W.3. under the following reference, S.3657/61/NSC/ENG.2.

#### **AWARDS**

#### BUILDING AND DECORATING

(See also Housing Schemes)

(See also Housing Schemes)

Aylesbury, Bucks.—Following for B.C.: Construction of 253 garages at the Bicester Road housing estate—Direct Labour (recommended).

Site works for 88 garages at Meadowcroft, for B.C.—W. L. Wallace, 59 Buckingham Street, Aylesbury, £5,607 (recommended, subject to Ministry approval).

Barasley, Yorks.—Erection of a cooling hall for pig carcases at the Public Abattoir, for B.C.—I. Parkin and Sons, Carlton, Barnsley, £10,134 (recommended, subject to Ministry approval).

Blackburn, Lancs.—Erection of 14 garages and a laundrette at Montague Street revelopment area, for B.C.—Direct Labour (recommended). Estimated cost £3,815.

Bristol.—Erection of a seven-storey block of offices and showrooms at Baldwin Street, for McKay Securities—C. Bryant and Son, Ltd., Winterstoke Road, Bristol, 3. Alec F. French and Partners, architects, Pearl Assurance House, Queen Square and Messrs. Gleeds, quantity surveyors, 2 Park Street.

Burton-upon-Trent, Staffs. — Erection of licensed premises on site of 32, 33, 34 and 35 Station Road, for Worthington and Co., Ltd.—G. Hodges and Son, Ltd., Horninglow Street, Burton-upon-Trent, Plans by Staff Architect and Sutcliffe, Son and Partners, quantity surveyors, Madeley Manor, near Crewe.

Camberwell. — Erection of a pavilson at Wilson's Grammar School playing field, for

Crewe.

Camberwell. — Erection of a pavilion at
Wilson's Grammar School playing field, for
L.C.C.—T. Cutler and Sons, Ltd., Lewisham,
£11,276.

£11,276.

Darlington, Dur.—Erection of the Branksome Secondary School for the B.C. E. A. Tornbohm, borough architect—building work—Derek Crouch, Ltd., Station Road, Birtley, Co. Durham, £135,732; steelwork—Gardiner, Sons and Co., Ltd., Bristol, £56,535; heating—G. N. Haden and Sons, Quayside, Newcastle upon Tyne, £24,361; electrical work—Cox Walkers, Ltd., Feethams, Darlington, £14,546.

Derby,—Subcontracts for new workshops, offices and petrol filling station at St. Helen's Street, for the Universal Car Co. (Derby), Ltd.—Roof sheeting and vertical cladding—Robertson Thain, Ltd.; suspended ceilings—A. Wright (Tilers), Ltd.; structural steelwork—Geo. Sands and Son, Ltd.; hollow beam floors—Constone, Ltd.; ventialing engineers—Airmetal, Ltd.; curtain walling and metal windows—Crittall Manufacturing Co., Ltd.; lift installation—Messrs. Laycock Engineering Co., Ltd.; ireproof doors—Dreadnought Fireproof Doors, Ltd.; sliding folding doors—Bolton Gate Co., Ltd.; ironmongery—Wing and Webb, Ltd.; underfloor heating and electrical installations—Batterby and Hefford, Ltd.; granolithic floor finishes—The Empire Stone Co., Ltd.; sanitary fittings—Buxton Dawson, Ltd.; shop fitters—Byard and Green, Ltd. The main contractors are Ford and Weston, Ltd., Derby. (The Contract Journal, Oct. 5, 1961).

Enfield, Middx.—Following for B.C.: External redecoration at George Spicer School—A. W. Southall and Son, 26 Shaw Road, Enfield, £1,241; external redecoration and renewal of guttering at Chace Boys' School—T. C. Firmin and Sons, Ltd., 106 Lancaster Road, Enfield, £1,595; internal redecoration at Theobalds Park Secondary School—F. Troy and Co., Ltd., Troy House, Elmgrove Road, Harrow, £4,238 (recommended).

Enfield, Middx.—Following for B.C.: Reconstruction of the Durants Park public convenience—T. C. Firmin and Sons, Ltd., 106 Lancaster Road, Enfield, £4,470; provision of concrete framing, roofing and infilling of the paper baling shed—Bell and Webster, Ltd., Essex Road, Hoddesdon, Herts, £1,994 (recommended).

Exteter,—Modernisation of Topsham Barracks, for the War Office—E.B.C. and Sleeman, Ltd., Marwood House, St. Pauls Hill, Exeter. Estimated cost £485,000. Salisbury and Chandler, Coombe House, Coombe Street, London, S.W.I., are the structural consultants for the scheme, Work has commenced.

Farnborough, Hants.—Provision of 94 garages at various estates, for U.D.C.—Sectional Concrete garages at Forest Road, for U

Ltd., Sub-contractors for the erection of Ebordene Aged Persons Hostel—asphalt roofing—Northern Asphalt Co., Ltd.; Bison precast floor and roof beams—Concrete Northern, Ltd.; Iin and thermoplastic floor pavings—A. Andrews and Sons, Ltd.; roof tiling—James Seasons, Ltd.; tarmac road works—Trinidad Lake Asphalt Co., Ltd.; steelwork—Dunlop and Ranken, Ltd.; steel fence, rails and balustrading—Isaac Robson and Co., Ltd.; precast concrete eaves units—Cawood Wharton and Co., Ltd.; painter—Marsh, Jones and Cribb, Ltd.

painter—marsh, Jones and Cribb, Ltd.

eeds.—Following for City Council: Extensions to garage at Upper Wortley police
station—H. Johnson and Sons (Farsley),
Ltd., New Street, Farsley, Pudsey, £1,537
(recommended, subject to Home Office
approval)

(recommended, advisors) approval).

Provision of additional toilet accommodation at the Airport—Direct Labour (recommended). Estimated cost £4,000; interior painting of Kirkstall Road works—

M. Hitchen, 6 Raynville Road, Leeds, 12, £1,044. Erection of 47 garages at Lincoln Green and New Carlton and 14 garages at Leafield—N. B. Bell and Co., Ltd., £7,312 and Reema Construction, Ltd., £2,272

and Reema Construction, Ltd., £2,272 respectively (extension of contracts, recommended, subject to Ministry approval).

Erection of sports pavilion at Stanningley recreation ground—Spooners (Hull), Ltd., Glebe Road, Stoneferry, Hull, £3,450 (recommended); interior painting at South Lodge and extensions to Gledhow Manor House — Direct Labour (recommended). Estimated cost £850 and £17,200 respectively:

Estimated cost £850 and £17,200 respectively.

Leeds.—Subcontracts for new cellar block for Joshua Tetley and Son, Ltd.—piling—Cementation, Ltd.; steelwork and reinforcing—Modern Engineering (Bristol), Ltd., who also designed the structure; formwork and shuttering—Scaffolding (G.B.), Ltd.; design of pile caps—B.R.C., Ltd. The main contractors are R. M. Thompson, Ltd., Leeds (The Contract Journal, Oct. 5, 1961).

London.—Erection of a block of showrooms, offices and flats at 11/15 Arlington Screet, St. James', S.W.I, for Kingsmere Investment, Co., Ltd.: main contractor—Myton, Ltd. Estimated cost £100,000; subcontractors and suppliers; windows—Crittall Manufacturing Co.; stock bricks—Messrs. Eastwoods; heating and plumbing—Ellis (Kensington), Ltd.; electrical work — Freeman Electrical Co.; ready mixed concrete, sand and ballast—Messrs. Greenham; lifts—Hammond and Champness; manually operated turn-table in basement—H. and C. Davis; steel (supply only)—Hy-Ten Reinforced Co., Ltd.; palvement lights—Lenscrete, Ltd.; hollow pots—London Brick Co.; granite—Marmi, Ltd.; piling—Piling and Construction, Co. R. Selfert and Partners, architects, 34 Red Lion Square, Holborn, W.C.1 and Reinforced Concrete, Ltd., consulting engineers.

Erection of an office block and warehouse

architects, 34 Red Lion Square, Holborn, W.C.I and Reinforced Concrete, Ltd., consulting engineers.

Erection of an office block and warehouse at City Road, E.C.I., for the Church Commissioners for England—Richard Costain (Construction), Ltd., 111 Westminster Bridge Road, London, S.E.I. Estimated cost £300,000. Work commenced.

London. — Following for City Corporation: Works at Camden Dwellings—S. M. Rintoul, Ltd., 80 Copenhagen Street, London, N.I., £3,069 (recommended): Bristow and Darlington, Ltd., £4,300; Mullen and Lumsden (Maintenance), Ltd., £3,926; F. S. Watts and Co., £3,342; R. G. Jones, £3,295.

Works at 292-312 York Way — S. M. Rintoul, Ltd., £5,497 (recommended), E. C. Sames and Co., Ltd., £7,156; Taylor Bros. (London), Ltd., £5,804; J. Cole (Painting), Ltd., £5,802; Bristow and Darlington, Ltd., £5,592.

Masons' and paviors' works for a period of three years commencing Jan. 1—William F. Rees, Ltd., 54 Victoria Street, London, S.W.I (recommended).

F. Rees, Ltd., 54 Victoria Street, London, S.W.I (recommended).
Second phase of temporary works at the fish, fruit and vegetable section of the central market—Sir Robert McAlpine and Sons, Ltd., 80 Park Lane, London, W.I. £8,950 (recommended, negotiated tender).

Maidstone, Kent.—Improvements to 50 houses at Upper Fant Road, for B.C.—A. J. Godfrey and Sons, Ltd., Herne Bay, £11.634 (recommended, subject to Ministry approval).

(recommended, subject to Ministry approval).

Marshland, Norfolk.—Conversion work in houses at Station Road, Walpole St. Andrew, for R.D.C.—W. G. Smith (Terrington), Ltd.. Lynn Road, Terrington St. Clement, King's Lynn, £3,485.

Middlesbrough, Yorks.—Construction of a shopping precinct in Dundas Street, for Metropolician Railways Surplus Land Co. Ltd. Cartwright, Woollatt and Partners, architects, Clarendon Street, Nottingham—Richard Costain, Ltd., Marton Road, Middlesbrough; Steelwork, Dorman Long and Co. Ltd., Middlesbrough. Work commenced.

Middless-—Sub.contracts for London Airnort

Middlesbrough; Steelwork, Dorman Long and Co., Ltd., Middlesbrough. Work commenced. Middlesex.—Sub-contracts for London Airport wing hangar extension, Phase I, for B.O.A.C.—Hangar cranes—Clayton Crane and Hoist Co., Ltd.; alterations to hangar doors—H.B.R. Metal Industries, Ltd.; heating and ventilating—Benham and Sons, Ltd.; sprinkler system—Mather and Platt, Ltd.; sprinkler system—Mather and Platt, Ltd.; glazing—British Challenge Glazing Co.; plumbing—Henry Tattersall, Ltd.; preaking up existing concrete aprons—St. Ives Sand and Gravel Co., Ltd.; steelwork—Robert Watson and Co., Ltd.; steelwork—Robert Watson and Co., Ltd.; supply of reinforcement—Guest, Keen and Nettlefold (Sou'n Wales). Ltd. The main contractors are W. and C. French, Ltd., Buckhurst Hill, Essex (The Contract Journal; Oct. 19, 1961).
Newcastle upon Tyne.—Subtrades in connection with the construction of swimming baths, for City Council. Cackett, Burns, Dick and MacKellar, architects. 21 Ellison Place. Newcastle—filtration plant—Bell Brothers, Manchester; electrical work—A. F. Jemison, Ltd., Station Road, New-

castle; heating, ventilating and laundry equipment—Haden and Sons, 79 Quayside, Newcastle upon Tyne (main contractors are John Twiname, Ltd., Cockermouth, Cumb.).

Northumberland. — Erection of Longbenton
Day School, for C.C. C. C. Brown, county
architect—Kendall Cross and Co., Ltd.,
Mill House, West End, Ponteland,
Northumb. Estimated cost £55,600.

Northumb. Estimated cost £55,600.

Northwood, Middx.—Erection of licensed premises at Maxwell Road, Northwood, for Benskins Watford Brewery, Ltd.—Howard Farrow, Ltd., Golders Green Road, London, N.W.II, £39,000; Ardin & Brookes and Partners, architects, 6 Cavendish Place, London, W.I, and Higgins and Partners, quantity surveyors, 96 Piccadilly, London, W.I.

Oxford.—Sub-contractors for statistical law and English libraries, Manor Road, for the Oxford University — Non-sub-contracts: Piling—The Cementation Co., Ltd.: asphalter —The Cambridge Asphalte, Co., Ltd.: pavior and plasterer—Pollock Bros., Ltd.: black ferrolite floor tiling and white glazed wall tiling.—Parkinsons (Wall Tiling), Ltd.: copper roofing.—Stoner and Saunders. Ltd.: painting—J. J. Hamilton. Nominaæde sub-contracts: Aluminium door and windows, etc.—Crittall Manufacturing Co., Ltd.; lift ins:allation — Hammond and Champness: heating and ventilating, hot and cold water services — Weatherfoil, Ltd.: electrical installation—N. G. Bailey and Co., Ltd.; surface water pumping equipment—Lee Howl and Co. The main contractors are William Sindall, Ltd., Cambridge (The Contract Journal, Oct. 12, 1961).

Portsmouth.—Following for City Council: erection of six shops, with six garages, six maisonnettes, two flats and estate office at Paulsgrove—Auriol (Builders), Ltd., Fizzherbert Road, Farlington, Portsmouth, £47,850 (recommended); H. Jones and Son (Portsmouth), Ltd., £58,899.
Alterations and additions to George Street Junior Mixed and Infants' School and Copnor Modern School for Girls—A. E. Porter and Son, Ltd., 57 Church Street, Por.smouth, £19,908 (recommended); Incroad, Ltd., £20,273; Payne Bros. (Portsmouth), Ltd., £22,630; John Lay and Co. (Portsmouth), Ltd., £22,630; John Lay and Co. (Portsmouth), Ltd., £23,103; Barnes and Elliott, Ltd., £24,779.

Provision of additional amenities at Eastern Road and Cliffdale caravan sites—A. E. Porter and Son, Ltd., £3,757 and £6,361 respectively (recommended); Barnes and Elliott, Ltd., £4,24,779.

Provision of additional amenities at Eastern Road and Cliffdale caravan sites—A. E. Porter and Son, Ltd., £5,757 and £6,361 respectively (recommended); Barnes and Elliott, Ltd., £6,537 and £8,998; John Lay and Co., £4,68 and £8,736.

St. Hellens, Lancs.—Erection of a new depot at Haydock Lane on the Haydock Industrial estate, for William Twist and Sons, Ltd., 80 (Centre—H. Caw

Green, Penn, Bucks. Estimated cost £170,000. Work just commenced.

Stoke Newington.—Provision of a housecraft centre at Wordsworth County Secondary School, for L.C.C.—S. M. Rintoul, Ltd., Islington, £4,177.

Stratford-upon-Avon, War. — Construction of youth centre extension to Shottery Memorial Hall—Tom Pettifer (Contractors). Ltd., Clopton Road, Stratford-upon-Avon. Estima.ed cost £8,747. Francis W. B. Yorke, Harper and Harvey, architects, Central Chambers and John Harper and Partners, quantity surveyor, 48a Calthorpe Road, Edgbaston, Birmingham.

Sunderland, Dur.—Erection of six shops and flats and six garages, Gleneagles Road, Grindon Village Estate, for the B.C. T. H. Rae and Partners, quantity surveyors, 5 Green Terrace, Sunderland—Middleton and Co. (Sunderland), Ltd., Queen Alexandra Bridge Approach, Sunderland, £35,792.

Surrey.—Erection of 82 garages at St. Helier estate, for L.C.C.—Bell and Webster, Ltd. Essex Road, Hoddesdon, Herts., £13,280.

Swindon, Wilts.— Construction of new

Surrey.—Erection of 82 garages at St. Helier estate, for L.C.C.—Bell and Webster, Lid. Essex Road, Hoddesdon, Herts., £13,280.

Swindon, Wilts. — Construction of new premises for Martin's Bank, Ltd.—Ford and Weston, Ltd., 34 Imperial Square, Cheltenham, £43,598. Sir Hugh Casson, Neville Conder and Partners, architects, 35 Thurloe Place, London, S.W.7, and A. S. Wilson and Partners, quantity surveyors, College Street, Winchester.

Wallasey, Ches.—Erection of a departmental store at Liscard Road, for the Birkenhead Co-operative Society—Direct Labour.

Wandsworth.—Construction of a clubroom and ocher work at Clarence Avenue site, Clapham Park estate, for L.C.—C. Ash and Son., Ltd., Wandsworth, £8,500.

Wellington, Salop.—Construction of an R.C. secondary modern school at Apley estate, D. Williams of A. Farebrother and Partners, architects, 99 Seymour Grove Manchester, 16—J. Parnell and Son, Ltd., Oliver Street, Rugby. Estimated cost £150,000 work commencing in new year.

West Hartlepool, Dur. — Construction of college of further education (Phase one), for the E.C.—Crudens, Ltd., Musselburgh, Scotland, estimated cost £435,961; R. H. Duns, quantity surveyor, Lambton House, Lambton Road, Newcastle upon Tyne: Cairns and Byles, consulting engineers, 80 Osborne Road, Newcastle upon Tyne: Cairns and Byles, consulting engineers, 80 Osborne Road, Newcastle upon Tyne: Cairns and Byles, consulting engineers, 80 Osborne Road, Newcastle upon Tyne: Cairns and Byles, consulting engineers, 80 Osborne Road, Newcastle upon Tyne: Expanded Metal Co., Ltd., structural consultants Stranton Works, West Hartlepool, Wigston, Leics.—Construction of a warehouse, showroom and offices at Gloucester Crescent, for C. S. Martin Holdings, Ltd.—A. E. Farr, Ltd., Station Road, Westbury, Wilts. J. N. Aylwin, 17 Soho Square, London, W.L., is the architect and L. Taylor, Carlisle House, 8 Southampton Row, London, W.L. is the architect and L. Taylor, Carlisle House, 8 Southampton Row, London, W.L. is the quantity surveyor—I. W. Baker, 169 Colley Road.

#### **CLOTHING AND TEXTILES**

Southampton.—Supply of clothing for water department employees, for B.C.: 49 uniform suits—Emeralda, Ltd., Cardiff, £10 19s. 3d. each; 81 mackintoshes—A. Talwith and Co. Ltd., London, £4 16s. 2d. each; 86 caps—Miller, Rayner and Haysom, Ltd., Southampton, 18s. 3d. each (recommended).

#### DEMOLITION

DEMOLITION

London.—Demolition works at the fish, fruit and vegetable section of the central market, for City Corporation—G. Cohen, Sons and Co., Ltd., Broadway Chambers, London. W. 6, £2,320 (recommended); Demolition and Construction Co., Ltd., £6,980; Sir Robert McAlpine and Sons, Ltd., £3,700; Goodman Price, Ltd., £2,995.

Newtownabbey, Antrim. — Demolition of premises known as Abbeyhill, 306 Shore Road, for U.D.C.—Geo, Cohen, Sons and Co., Ltd., Sydenham Road, Belfas:, 3, £42 (net debit charge).

Taunton, Som.—Demolition of 125, 127, 131 and 133 Kingston Road and 4 to 9 Florence Road, for B.C.—G. M. Edmunds, Ltd., The Lawns, Ashcott, Bridgwater, £841 (recommended).

Lawns, Ashcott, Bridgwater, £841 (recommended).

Torquay, Devon.—Demolition of 57 Union Street, and 2 and 4 Market Street, for B.C.—R. E. Narracott and Sons, Ltd., Dummere Road, Torquay, £880. Work to commence Jan. 1.

#### ELECTRICAL

Blackburn, Lancs,—Electrical installations in 44 fla:s (scheme 62) at Montaque Street redevelopment area, for B.C.—North Western Electricity Board, £7,450 (recom-mended).

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Durham.—Electrical work in following schools for Co.E.C.—Frosterley South Councy School and Wearhead County School—J. Paterson (Darlington), Ltd., Darlington, £1,221 and £1,088 respectively; Seaham Grammar Technical School—John Calvert, Ltd., Seaham, £16,964.

Ltd., Seaham, £16,964.

Hastings, Sussex. — Supply of 220 sets of wiring harnesses with lampholders for the rewiring of the promenade decorative lighting, for B.C.—D.R. Illuminations, Ltd., Stockport, Ches., £1,394 (recommended).

Leds.—Elec.rical installation for the East Leds Hostel for Women, for City Council—Shaw, Dale and Co., Ltd., Templar House, Lady Lane, Leeds, £2, £1,981.

Lady Lane, Leeds, 2, £1,981.

Leeds.—Following for City Council; electrical work at Gipton Police Station—B.C.S. Electrics, Ltd., 10 Mill Hill, Leeds, 1, £878; lighting improvements at Armley and Compton Road branch libraries—Direct Labour (recommended). Estimated cost £1,100 and £850 respectively.

Supply and installation of a lift at Ebordene aged persons hostel—Keighley Lifts, Ltd., Keighley, £3,256 (recommended).

Lifts, Ltd., Keighley, £3,256 (recommended).

Maidstone, Kent. — Electrical installation in
the old people's hostel at Shepway estate,
for B.C.—Horton and Baird, Ltd., £2,045
(recommended).

St. Pancras. — Electrical installations in
Wellesley Buildings at Churchway estate,
for L.C.C.—Renouf and Calvert, Ltd.,
Pinner, Middx., £2,620.

#### FENCING

Beddington and Wallington, Surrey.—Erection of feneing at Miller's Orchard estate for B.C.—Modern Rustics Co., Ltd., Mitcham, £897 (recommended).

Carliste, Cumb.—Provision of concrete posts and chain link fencing at Creighton Playing Field, for City Council—C. Harkness, Carlisle, £340 (recommended).

Nottinghamshire.—Supply and erection of post and rail wooden fencing and the resection of existing chain link fencing on the Newark—Lincoln trunk road A.46, for C.C.—Belmont Fencing Co., Creswell, Worksop, £808. Work about to commence.

worksop, £808. Work about to commence. Sheffield.—Supply and fixing ornamental railings and entrance gates, and Coats of Arms in bronze to the proposed entrance gates at Manor Lodge, for City Council.—Bayliss, lones and Bayliss, Ltd., Victoria Works. Cable Street. Wolverhampton, £1,068 (recommended).

#### GAS AND WATER SUPPLY

Barnack, Peterborough.—Construction of the Pilsgate-Whitering water supply scheme, for R.D.C. — Stamford Construction, Ltd., Uffington Road, Stamford, £13,506.

Carlisle, Cumb.—Erection of a booser pumping station at Harraby, for the River Eden abstraction scheme, for City Council—Border Engineering Contractors, Ltd., Whitehaven, £8,257 (recommended).

Whitehaven, £8,257 (recommended).

Hastings, Sussex.—Supply of special strength pipes and the construction of the culvert on the Pebsham Tip, for B.C.—Sharp, Jones and Co., Ltd., 29 Dorset Square, London, N.W.1, £6,926 and George S. Dicker (Engineers), Ltd., 137 Hughenden Road, Hastings, £12,413 (recommended, subject to Ministry approval).

Huntingdonshire.—Site investigations for the Diddington reservoir scheme for the Great Ouse Water Authority—G. Wimpey and Co., Ltd., London, W.6, £12,208 (accepted); Foundation Engineering, Ltd., £13,732; Soil Mechanics, Ltd., £22,012. Work commenced.

Leeds.—Supply of following for City Council: Special castings—Clay Cross Iron and Foundries, Ltd., Clay Cross, £1,135; pipe and specials—Stanton and Staveley Sales, Ltd., Nottingham, £28,078; pipes and specials—Clay Cross (Iron and Foundries), Ltd., £5,542.

Perth.—Water supply scheme, Contract 1, for City Council—

Perth.—Water supply scheme, Contract 1, for City Council—J. McAdam and Sons, td., Bankfoot, Perths., £134,141.

Poole, Dorset. — Trunk main—Lytchett Matravers to One Elm, for Poole and East Dorset Water Board—R. S. Rendle, engineer and surveyor—G. and G. F. Maidment (Poole), Ltd., Cranbrook Road, Parkstone, Poole, £13,620. Work to commence Jan.

Ross and Cromarty.—Construction of the Conon Bridge water and drainage scheme, for C.C.—Buchan and Sons, Cradlehall, Inverness.

West Kesteven, Lines.—Improvements to the Colsterworth water supply, for R.D.C.—Samford Construction, Ltd., Uffington Road, Stamford, £3,623.

#### HARBOURS, PIERS AND SEA DEFENCE WORKS

Whitby, Yorks.—Development of the Upper Harbour, for U.D.C.—Yorkshire Hennebique Contracting Co., Ltd., 123 The Mount, York, £69,378 (subject to Ministry approval).

#### HEATING AND VENTILATING

HEATING AND VENTILATING
Peterborough. — Mechanical engineering services for the third and fourth instalments of
the Technical College, for the Joint Education Board—Norris Warming Co., Ltd.,
Ipswich, £22,660.
Sheffield.—Removing and replacing heating
and cooking appliances in 15 dwellings
within the Smoke Control Area No. 2, for
City Council — Direct Labour (recommended). Estimated cost £1,329.

#### HOUSING SCHEMES

HOUSING SCHEMES

Acton, Middx.—Sixteen-storey block and a four-storey block of flats at Osborne Road. stage 6, for B.C.—Tersons, Ltd., 4 Dollis Park, London, N.3, £299,475 (recommended, subject to Ministry approval).

Ashton-under-Lyne, Lancs.— Two hundred and eight flats in three 12-storey blocks, 100 maisonnettes in four 5-storey blocks, four shops and 95 garages, etc., at Ellison Street redevelopment area, for B.C.—Fram Reinforced Concrete Co., Ltd., 165 Plymouth Grove, Manchester, 13, £862,580 (recommended, subject to Ministry approval), Francis Jones and Son, architects, 173 Coxford Road, Manchester, 13, and M. Seward, quantity surveyor, 334 Wellington Road North, Heaton Moor, Ches.

Barnsley, Yorks.—Fifty old persons' dwellings

Seward, quantity surveyor, 334 Wellington Road North, Heaton Moor, Ches.

Barnsley, Yorks.—Fifty old persons' dwellings on the St. Helen's estate, 26 at Dillington Square, Worsbrough Common; 11 at Athersley North, eight at Waltham Street and six at Rothersham Road, for B.C.—Direct Labour, £126,153 (recommended, subject to Ministry approval).

Bath, Som.—Eighteen dwellings at Twerton-Whiteway housing estate for City Council—E. Mortimer and Son, Ltd., High Street, Bath, £35,425.

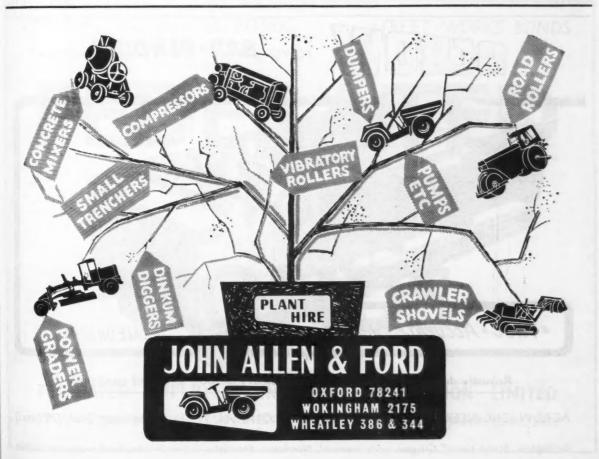
Beddington and Wallington, Surrey.—Conversion of 111/113 Woodcote Road into flatlets, for B.C.—F. H. Claridge and Son, Ltd., 105 Stafford Road, Wallington, £11,084 (recommended, subject to Ministry approval).

Bicester, Oxon.—Six Homeville traditional bungalows at Ray Road, for U.D.C.—W. A. Price and Son, Ltd., Bicester.

Blackburn, Lancs.—One hundred and twentysix flats at Montague Street redevelopment area, for B.C.—Direct Labour, £201,567 (recommended, subject to Ministry approval).

Bridgwater, Som.—Erection in permanent brick construction of 16 three-storey terrace

Bridgwater, Som.—Erection in permanent brick construction of 16 three-storey terrace houses with garages and 13 lock up garages,



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with necessary site works, fencing, drainage, etc., at St. Matthews Field and Albert Street, for B.C.—J. Standerwick and Son, Ltd., Taunton Road, Bridgwater, £52,889 (subject to Ministry approval). Work to commence Jan.

Croydon, Surrey.—Thirty-six flats and 36 garages at The Homestead, Gibsons Hill. for Elsenham Properties, Ltd. Challen and Floyd, architects, 7 Cromwell Road, London, S.W.7—Stirton Partners, Ltd., 28 Victoria Street, London, S.W.1. Estimated cost £15,000.

Epsom and Ewell, Surrey.—Six houses at Chessington Road, for B.C.—H. Weller and Co., Ltd., Banstead, £20,777.

Great Yarmouth, Norfolk.—Sixty-two flats, 32

Epsom and Ewell, Surrey,—Six houses at Chessington Road, for B.C.—H. Weller and Co., Ltd., Banstead, £20,777.

Great Yarmouth, Norfolk.—Sixty-two flats, 32 maisonnettes and 10 garages in the Priory Street-Bull's Lane area, Gorleston, for B.C.—R. G. Carter, Ltd., Drayton, Norwich, £159,000 (subject to Ministry approval).

Hastings, Sussex.—Following for B.C.: Six flats and five garages at 95-96 All Saints Street—Eldridge and Cruttenden, Ltd., St. Leonards-on-Sea, £11,150 (recommended, subject to Ministry approval).

Aerial survey of land at Scutes Farm and at Broomgrove and Pine Avenue for housing purposes—Meridian Airways, Ltd., Shoreham-by-Sea, £438 and £514 respectively (recommended).

Havant and Waterloo, Hants.—Twenty-four houses, together with drainage and external works and one four-storey block of 16 maisonnettes and two three-storey blocks comprising eight maisonnettes and four flats with drainage and external works at Milton Road, Waterlooville, Hants.

Holland.—Erection of a fire officer's house and firemen's houses, for C.C.—F. Budge, Ltd., Tower Road, Boston, £3,099 and £10,295 respectively (recommended).

Hull.—Seventy houses and 29 garages on the Boothferry estate, for City Council—Stepney Contractors, Ltd., Grove Hill, Beverley, Yorks., £155,138 (recommended).

Lanarkshire.—One hundred and eighty-two houses and 94 garages at Shirrel Farm, Bellshill, for C.C.—George Wilson (Stone-house), Ltd., Loch Park, Stonehouse, £328,661; 16 houses at Lesmahagow, for C.C.—I, C. Burns and Co., Ltd., 34 Church Street, Larkhall, £29,887.

Leamington Spa, War.—Twenty-eight flats at Rugby Road, for Housing Committee—Savee Bros., Union Road, Leamington Spa, £71,196.

Leeds.—Following for City Council: Plasterer and granolithic work, Contract 887—272 dwellings at Mistress Lane and Welling on Hill—J. Phillips (Plasterers), Ltd., 123 Cemetery Road, Leeds, 11; painter, Contract 887—I. F. Meehan, Ltd., 12 Whitkirk Lane, Leeds, 15; plasterer and granolithic work, Contract 877, 232 dwellings on various sites—Wm. Airey and Son (Leeds), Ltd., Woodhouse Lane, Leeds, 2.

Maidstone, Kent.—Fifty-eight three-bedroom houses (scheme P.W.12) and 196 flats (scheme P.W.15) at Park Wood estate, for B.C.—E. and S. Cotton, Ltd., 20 High Street, Iver, Bucks., £125,773 and George Wimpey and Co., Ltd., 26 Hammersmith Grove, London, W.6, £299,548 respectively (recommended, subject to Ministry approval).

Portsmouth.—Fifty-four flats and 27 garages

Grove, London, W.6, £299,548 respectively (recommended, subject to Ministry approval).

Portsmouth.—Fifty-four flats and 27 garages at Clacton/Halstead Roads. stage 3, for City Council—H. E. Collins. Ltd., Eastern Road. Farlington, Portsmouth, £149,087 (recommended); Auriol (Builders), Ltd., £151,910; Barnes and Elliott, Ltd., £152,250; Howe and Bishop, Ltd., £164,866; Henry Jones and Son (Portsmouth). Ltd., £166,074.

Rugby, War. — One hundred and nineteen dwellings at Ryton-on-Dunsmore, 72 at Stretton-on-Dunsmore and two at Wolvey, for R.D.C.—Browning Construction Co., 19 Hillmorton Road, Rugby, £344,178 (subject to Ministry approval).

Scarborough, Yorks.—Twenty-seven houses at Eastfield, for the B.C. V. Forshaw, borough engineer.—Mollekin Brothers, Holbeck Hill, Scarborough.

Skelmersdale, Lancs.—Thirty houses on the Church Farm housing estate for U.D.C.—James Gee, 687 Ormskirk Road, Wigan, £59,290 (subject to Ministry approval).

k59,290 (subject to Ministry approval).

Southampton.—Ninety two-storey dwellings at Dale Valley Road, contract B.368, for B.C.
—Selleck Nicholls, Ltd., East Hill, St. Austell, Cornwall, £167,181 (recommended subject to Ministry approval).

South Shields, Dur.—One hundred and seven houses in the Reading Road area, for the B.C. John Reid, borough engineer—Whittal (Builders), Ltd., West Boldon, Co. Durham, £165,825.

Stirling.—Two hundred and fifty-seven houses at Borestone, St. Ninians, for B.C.—Cruden, Ltd., Olive Bank, Musselburgh, Edinburgh.

Sunderland, Dur.—Following for B.C. H. C.

Bishop, borough architect, 12 three-storey flats at Park Place East—James Prentice, Ltd., Leeds Szreet, Sunderland; 176 houses in the Coronation Street area—G. M. Pearson and Son, Front Street, Hetton,

Co. Durham, £502,763; 156 dwellings in the Parade redevelopment area—L. W. Evans (Contractors), Ltd., 18 Norfolk Street, Sunderland, £304,439; four houses and 18 garages on the Grindon village estate—Docherty and Son, Hylton Road, £9,276.

Thornaby-on-Tees, Yorks.—Thirteen bungalows at Scalby Square, for the B.C. J. L. Watson, borough engineer—T. A. Greenwell and Co., Ltd., 145 Albert Road, Middlesprough (recommended).

brough (recommended).

Ventnor, I. of W.—Eight old people's flatlets in Spring Hill, for U.D.C.—A. Carpenter and Son, 8 Clarendon Road, Shanklin, I. of W., £11.009. Work commencing Feb. 1.

Wallsend, Northumb.—Sixty-six houses at Perth Gardens for B.C. C. E. Faddy, borough engineer—J. H. James, Ltd., Archer Street, Wallsend, £91,490.

Wallsend, £91,490.

Whittlesey, I. of E.—One hundred and fifteen Homeville traditional houses, flats and bungalows and roads at New Road, for U.D.C.—H. J. Firman, Ltd., Newark Road, Peterborough.

York.—One hundred and fifty-two dwellings, two shops with maisonnettes and 34 garages at Windsor Garth-Kingsway, West Side, for City Council—Sorrell (Yorks.), Ltd., 95 Heworth Village, York., £245,900 (recommended).

#### MATERIALS AND SUPPLIES

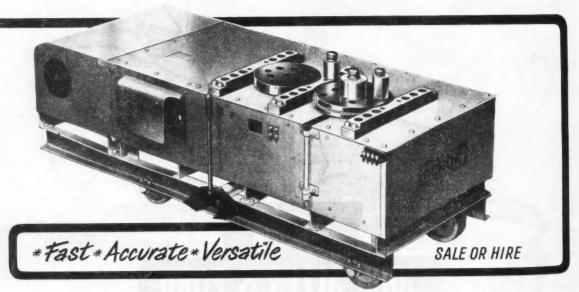
MATERIALS AND SUPPLIES

Leeds.—Supply of following for City Council: Plastic press cloths for Knostrop sewage disposal works Heath Filtration, Ltd., Sneyd Mills, Newcastle Street, Burslem, Stoke-on-Trent, £2,099; sewer ironwork for the period Jan. 1 to Dec. 31, 1962—J. Needham and Sons, Ltd., £11,280 (recommended).

Leeds.—Supply of following for the East Leeds Hostel for Women for City Council—sanitary goods—Raine Bros. (Leeds), Ltd., 27 Crown Street, Leeds. 2, £492; precast concrete floor beams—Pierhead, Ltd., The Boulevard, Liverpool, 24, £1,706; ironmongery—Ryecrofts, Ltd., 80 Thornton Road, Bradford, 1, £659.

Portsmouth.—Supply of 27,860 coloured and clear lamps for the sea front illuminations for City Council—Union Lamps and Lighting Co., Ltd., £1,407 (recommended); Luxram Electric, Ltd., £1,821; Ascot Lamps and Lighting, Ltd., £1,935; J. and N. Wade, Ltd., £2,253; Whitworth Electric Co., Ltd., £2,253; Harbottle Leeson, Ltd., £2,262; Daytona, Ltd., £2,262; G.E.C., Ltd., £2,268; Philips Electrical, Ltd., £2,424; A.E.I. Lamp

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and Lighting Co., Ltd., £2,474; Atlas Lighting Co., Ltd., £2,749.

#### PLANT AND MECHANICAL TRANSPORT

leeds.—Supply of following for City Council:
Three contractors mobile mess cabins—
William Firth (Tools), Ltd., 5 Park Square,
Leeds, 1. £570; a Ford Thames pick-up
vehicle—Brown and White (Leeds), Ltd., 98
Roundhay Road, Leeds, 7, £520 (recommended).

haidstone, Kent.—Supply of one 24 cu. yd. paper salvage collection vehicle, for B.C.—Rootes, Ltd., Devonshire House, Piccadilly, London, W.I, £1,370 (recommended).

Swadlincote, Derbys.—Supply of one dieselengined road sweeping machine for U.D.C.—R. W. Kenny, Ltd., Stanton, Burton-on-

wiltshire.—Supply of two water tenders for the Fire Authority — H.C.B. Engineering, Ltd., Totton, Southampton. Estimated cost £4,000 each.

#### PLAYING FIELDS, PARKS, ETC.

FLATING FIELDS, PARKS, ETC.

In Pancras.—Layout of grounds at Holly Court Day Special School, for L.C.C.—St. Mary's (Contractors), Ltd., Islington, £3,219.

Wandsworth.—Garden works at Roehampton Lane site and laying out of gardens at Argyle estate extension, for L.C.C.—Edward Gait Construction, Ltd., Kingston-upon-Thames, Surrey, £3,178 and St. Mary's (Contractors), Ltd., Islington, £3,412 respectively.

#### RAILWAY ENGINEERING

British Railways.-Following contracts placed: Region:

Office and window cleaning at King's Cross station and adjacent premises—General Cleaning Contractors, Ltd., Boundary House, 56-58 Worship Street, London, E.C.2.
Construction of concrete inverts and steel sheet-piling training walls at underline bridge No. 155 over River Rother, between Woodhouse and Waleswood (closed)—W. and C. French, Ltd., South Brink, Wisbech, Cambs.
Maintenance and renewal attentions

ambs.
Maintenance and renewal, etc., of per-lanent way — Tersons, Ltd., Dollis Park, manent way — Tersons, Ltd., Dollis Park, London, N.3. Demolition of engine repair shop, work-shops, stores, coaling plant, etc., conversion

of office building into temparary messing and ablution accommodation, construction of high level loading dock and reconstruction of superstructure to underbridge No. 25 and partial reconstruction and widening of underbridge No. 82 at Grimesthorpe Freight Depot, Sheffield—W. and C. French, Ltd., South Brink, Wisbech, Cambs. Reconstruction and widening of Temple Mills Lane overbridge No. 658, between Stratford and Lea Bridge—Thomas Fletcher and Co., Ltd., Forest Road, Mansfield, Notts.

Notts.

Dismantling, overhaul, modification of one 50-ton Goliath crane at Sheffield Bridgehouses, and re-erection, testing and painting of same at Mile End—Cowans, Sheldon and Co., Ltd., P.O. Box 9, St. Nicholas Works, Carlisle.

London Midland Region:

ondon Midland Region:
Resurfacing portions of platforms at St.
Helens Shaw Street Station—The Trinidad
Lake Asphalt Co. (North Western), Ltd.,
Liverpool, 2.
Addendum for provision of openings in
the Midland Shed at the new freight
terminal, Leicester Queen Street—Wilson
Lovatt and Sons, Ltd., Wolverhampton.
Construction of a new underbridge to
carry the railway over the Bletchley Road,
at Bletchley Station—Leonard Fairclough,
Ltd., Addington, Lancs.
Repairs to stone balconies at St. Pancras
Chambers—Szerelmey, Ltd., London, S.E.16.

#### RIVER AND FLOOD PREVENTION WORKS

Shrewsbury, Salop. — Improvement of the river bank at Mardol Quay by terracing, for B.C. A. T. Morris, borough surveyor—Direct Labour (recommended). Estimated cost £2,850.

#### ROADS, BRIDGES AND SITE WORKS

Abertillery, Mon.—Church Street bus stop improvement, route A.467, for U.D.C., including the setting back of a masonry wall to provide a bus bay, with appurtenant road, footpath and kerb works. Reginald H. Eke, engineer and surveyor—I. F. Dymond, 30 High Street, Newport. Work has commenced menced

Acton, Middx.—Laying out car park at The Vale east of Bromyard Avenue, for B.C.—Grassphalte, Ltd., 90 High Street, Hampton Hill, £3,226 (recommended).

Blackburn, Lancs.—Supply and erection of a tubular steel bridge across the River Darwen at Pleasington Playing Fields, for B.C.—Tubewrights, Ltd., Charleywood, Road, Kirkby Trading Estate, Simonswood, Liverpool, £2,200 (recommended).

Bolton, Lancs.—Construction of roads and sewers for a large housing site off Wigan Road, for the Sutton Housing Trust, Ltd., Victoria House, Southampton Row, London, W.C.1. Frank Bradley, architect, 4 Wood Street, Bolton—A. E. Yates, Ltd., Herbert Street, Horwich, £100,000.

Cork, Eire.—Construction of reinforced concrete roadways, foundations, floors, etc., in connection with the erection of a steel frame building at Watercourse Road, for Brooks, Thomas and Co., Ltd., Dublin, Lames Buchan, architect, 50 South Mall, Cork.—O'Shea's, Ltd., South Mall, Cork. £10,848 (accepted); J. Sisk and Sons, Ltd., £11,694; D. Hegarty and Sons, Ltd., £12,270; I. J. O'Leary and Sons, £12,272; J. and G. Murphy, Ltd., £12,459; Patrick O'Donovan, £13,313; E. Barrett and Sons, £13,827; Sexton Bros., £14,411.

Dumfriesshire.—Carlisle-Glasgow trunk road, A.74. Widening of existing dual carriage.

£14.411.

Dumfriesshire.—Carlisle-Glasgow trunk road,
A.74. Widening of existing dual carriageways south of Johnstonebridge, for C.,
James Robertson, county surveyor—James
Miller and Partners, Ltd., 18 George Street,
Edinburgh, 2. Work is expected to commence Jan. 8.

Esfield, Middx.—Following for B.C.: Private street works at Addison Road and Alma Road—Linney and McLaughlin, Ltd.. Mount Drive. Park Street, Herts., £4,480 and £10,467; Chapel Street, part 1 and part 2. and Painters Lane—Robertson, Collins and Jones, Ltd., £3,120, £578 and £22,417, respectively (recommended).

Carpeting of the carriageway at the Manor Farm estate—Amalgamated Roadstone Corporation, Ltd., 15 Stanhope Gate, London, W.1, £3,350 (recommended).

Epsom and Ewell, Surrey.—Maintenance and repair of footpaths, etc., during 1961-62, for B.C.—Keyphalte Surfacing Co., Ltd., 219 Blackfriars Road, London, S.E.1, £2,073 (recommended).

Farnborough, Hants,—Concrete bases for 94

ferommended.

Farnborough, Hants.—Concrete bases for 94 garages at various estates in Farnborough and Cove, for U.D.C.—B. Wattridge, Seale Lane, Seale, Farnham, £2,946 (recommended). mended).

CONTRACT GUARANTEE BONDS

STREET WORKS BONDS

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Faversham, Kent.—Construction of concrete garage bases and forecourts, etc., at Brents redevelopment and Abbots Road garage sites, for B.C. A. C. E. Richardson, borough surveyor—J. Augraph and Co., Rainham, Essex, £4,243 (accepted); Maidstone Contractors, Ltd., £6,120; Bensted Contractors, Ltd., £6,123; Hugh Brown (Engineers). Ltd., £6,232; O'Leary and Doran, £5,816.

Contractors, Ltd., £5,573; Hugh Brown (Engineers), Ltd., £6,232; O'Leary and Doran, £5,816.

Gloucestershire.—Exeter-Leeds trunk road, A.38, extension of Grovesend Tunnel, on the British Railways Yate-Thornbury Line, consisting of three 15ft, span R.C. arches, length 19ft., for C.C. R. A. Downs, county surveyor—A. E. Farr, Ltd., Station Road, Westbury, Wilts. Work commencing Jan.

Westbury, Wilts. Work commencing Jan.
Gravesend, Kent.—Repairs in tarmacadam and kerb works at Old Manor Drive, Echo Square, for N. M. Adams—Hodsons, Ltd., 17 Wrotham Road, Gravesend.
Havant and Waterloo, Hants.—Making-up of part of Scratchface Lane, for U.D.C.—Southern Counties Construction Co., Ltd., 204 London Road, Waterlooville, Hants.
Hereford.—Aerial survey of routes of the Eas:—West and the North-South relief roads, for City Council—B.K.S. Air Survey, Ltd., £677 and £1,239 respectively (recommended).
Hyde, Ches.—Making-up of private streets. Hyde. Making up of Brookside Drive and Carlton Road, Hyde, for B.C.—Apex Asphalters, Ltd., Owen Street, Stockport, £2,109.

Asphalters, Ltd., Owen Street, Stockport, £2,109.

Isle of Wight.—Widening of New Road, Brading, for C.C.—Direct Labour, £12,675.

Leeds.—Following for City Council: Private street works. Half Mile Gardens, S.anning-ley Road—Benstead Industries, Ltd., Isle Lane, Leeds, 11, £1,105; housing estate works—Meynell Street redevelopment area—Phase 2 and Belle Isle bungalow site—Leake and Carney, Ltd., 11 Holmfield Lane, Wakefield, £19,909 and £40,424 respectively.

Housing es:ate works on the Belle Isle estate (Area E)—Leake and Carney, Ltd., £38,951 (all recommended).

London.—Remaining site filling works on the

£38,951 (all recommended).

London.—Remaining site filling works on the north side of London Wall and the west side of Wood Street, for City Corporation—Willment Bros., Ltd., Balic Wharf, Waterloo Bridge, London, S.E.1. £3,839 (recommended); Sir Robert McAlpine and Sons. Ltd., £8,502; Mowlem (Civil Engineering), Ltd., £5,716; Fitzpatrick and Son (Con-

tractors), Ltd., £5,595; Goodman Price, Ltd., £4,236.
Londonderry.—Reconstruction of Londonderry to Limavady trunk road, T.7, from Drummaneny to Tullybrisland for C.C. H. K. Scoti, county surveyor—W. and J. Taggart (Northern Ireland), Ltd., Portrush, Co. Antrim, £111,967. Work is expected to start Jan.
Maidstone, Kent.—Demolition of buildings and construction on site of car park at Chapel Court and Union Square, for B.C.—P. A. Barden and Sons, Ltd., Weavering House, Ashford Road, Maidstone, £6,204 (recommended, subject to Ministry approval).
Ormskirk, Lancs. — Following for U.D.C.: Resurfacing parts of Liverpool Road South and Junc.ion Lane, Burscough and Moor Street—Trinidad Lake Asphalt Co. (North Westen), Ltd., India Buildings, Water Street, Liverpool, 2, £5,556.
Making up part of Collimmander Gardens—Charles L. Watren, Ltd., 78 St. Paul's Road, Wallasey, £3,189 (accepted); South W.C.E. (Wigan), Ltd., £4,016; K. J. Forrest, \$3,408.
Peterlee, Dur.—Following for Development

Road, Wallasey, £3,189 (accepted); South W.C.E. (Wigan), Ltd., £4,016; K. J. Forrest, £3,408.

Peterlee, Dur.—Following for Development Corporation: Contract 137, surfacing of Burnhope Way extension and Passfield Way, etc. (approximately 6,800 sq. yd. bitumen macadam base course and 21,300 sq. yd. of fine cold asphalt, etc.); 137B, paving verges, etc., on Burnhope Way extension, Passfield Way, etc. (approximately 4,100 sq. yd. concrete slab paving, etc); 139, roads and sewers—Eastway (approximately 400 lin. yd. flexible carriageway, together with 9in. diameter sewers, etc.). R. G. S. Roberts, chief engineer — Contract 137 — Tarmac Roadstone, Ltd., Northern Division, Bowesfield Lane, Stockton-on-Tees: contract 137B.—Joseph Crawford, Ltd., 39 Gilbert Road, Peterlee, Co., Durham; Contract 139—T. R. Illingworth and Co., Ltd., 72 Bailey Rise, Peterlee, Co., Durham (all recommended). Pontefract, Yorks.—Excavation for, and construction of, approximately 420 lin. yd. of precast concrete kerbing, channelling and edging; the construction and seeding of grass margins, excavations for and fixing of surface water gullies and connection to existing sewer and other ancillary works, at Eastbourne View, Baghill for B.C.—W. Small, Station, Road, Ossett.

Rugby, War.—Construction of roads and sewers at Stretton-on-Dunsmore and Ryton. on-Dunsmore, for R.D.C.—I. J. O'Malley and Co., 92 Dillotford Avenue, Coventry. £13,248 and Galliford and Wolvey, Hinckley, £21,848 Sunject to Ministry approval.

Shoreham-by-Sea, Sussex.—Widening of the A.27 road from Buckingham Park to Mill Lane, for West Sussex C.C.—Direct Labour. Estimated cost £3,500.

Skelmersdale, Lancs.—Paths, drains and fencing in connection with the erection of 30 houses on the Church Farm estate, for U.D.C.—Direct Labour, £2,150.

Somerset.—Construction of a new by-pass at Axbridge for C.C.—Direct Labour. Estimated cost £150,000. (Work expected to commence next summer).

Warwickshire.—Widening 1½ miles of trunk road A.5, between Witherley, near A:herstone and the Royal Red Gate Hotel, for C.C. D. Watson, county surveyor—Broderick and Ryan, Ltd., Nottingham Road, Ilkeston, Derbys., £105,823.

# SEWERAGE, SEWAGE AND REFUSE DISPOSAL

SEWERAGE, SEWAGE AND REFUSE DISPOSAL

Epsom and Ewell, Surrey.—Construction of soil drains at Auriol Park and Shadbolt Park, for B.C.—Dragon Plant Hire, Ltd. Walnut Tree Close, Guildford, £2,659 (recommended).

Faversham, Kent.—Bysing Wood and Oare Roads foul sewerage scheme, for B.C., comprising the construction of a sewage pumping station and the laying of asbestos rising main, and concrete pipe foul sewer, together with all other ancillary works. A. C. E. Richardson, borough surveyor—Wingham Engineering Co., Ltd., Wingham, near Canterbury, £60,708 (accepted), Arnold and Nathan, Ltd., £89,459; Richard Costain, Ltd., £95,517; T. H. Contractors, Ltd., £106,192; Hugh Brown, Ltd., £106,172; Bensted Contractors, Ltd., £112,435.

Havant and Waterloo, Hants.—Purbrook surface water drainage scheme, for U.D.C., comprising the construction of approximately 22 lin. yd. of 45in. diameter, 24 lin. yd. of 42in. diameter, 44 lin. yd. of 36in. diameter, 12 lin. yd. of 30in. diameter, 26 lin. yd. of 27in. diameter and 15 lin. yd. of 24in. diameter and 15 lin. yd. of 24in. diameter surface water sewers, the regrading and channelling of approximately 160 lin. yd. of open dirch, and anoillary

regrading and channelling of approximately 160 lin. yd. of open dirch, and ancillary



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works connected therewith—Messrs. Everyman's, Maudlin, Chichester, Sussex.

London.—Sewer and drainage works for a period of three years commencing Jan. 1, for City Corporation—D. R. Paterson, Ltd., 33 Granville Road, London, N.W.2 (recommended).

for City Corporation—D. R. Paterson, Ltd., 33 Granville Road, London, N.W.2 (recommended).

Maidstone, Kent.—Following for B.C.; Construction of superstructures for various buildings at the Aylesford Sewage Disposal Works and Alington Pumping Station sizes, contract W.2—R. Corben and Son, Ltd., Tonbridge Road, Maidstone, £72,356; supply and installation of flow measurement and control equipment in new buildings at Aylesford Sewage Disposal Works, contract M.9—Lea Recorder Co., Ltd., Abbey Orchard Street, London, S.W.I, £5,503 (recommended).

Newbiggin - by - the - Sea, Northumb. — Main

(recommended).

(recommended).

(recommended).

Newbiggin - by - the - Sea, Northumb. — Main drainage scheme on the Moor housing estate, for U.D.C. E. G. Lediard, consulting engineer, 4 Eldon Square, Newcastle upon Tyne—William Wallace and Sons, William Street, Gosforth. Northumb. (subject to Ministry approval).

Newburn, Northumb. — Construction of approximately 570yd. of 6in. to 12in. diameter pipe sewers with manholes and other incidental works at West Denton for U.D.C.—Wm. T. Wallace and Son, Ltd., William Street, South Gosforth, Newcastle, 3, £2,480.

Street, South Obsortin, Newcastle, 5, 22, 100.
Southampton.—Supply and installation of following at Millbrook sewerage works, for B.C.: Dual-fuel engines, alternators, switch gear and ancillary equipment.—National Gas and Oil Engine Co., £60,108; sludge pumper—Tangye, Ltd., 60 Grosvenor Stneet, London, W.I., £3,138; three communistors—Jones and Attwood, Ltd., Stroud, £5,424 (recommended).

recommended).
Swinton and Pendlebury, Lancs.—Construction of Clifton drainage, contract 4, for B.C.
Hussey, Egan and Pickmere, Ltd., Hawthorn
Lane, Sale, Ches., £50,847 (recommended,
subject to Ministry approval).

Lane, Bair, C.nes., 201,84/ (recommended, subject to Ministry approval).

Twickenham, Middx. — Reconstruction of sewer across a section of Bushy Park, Hampton Court, together with .he construction of manholes, for B.C.—A. S. Knolles, borough engineer.—H. Grant and Partners, Ltd., 80a Ivy Road, N.W.2, £2,008 (accepted); L. W. Brown and Sons (Contractors), Ltd., £2,226; J. E. Murphy, Ltd., £2,266; Kast Construction, Ltd., £2,605; Willment Bross, Ltd., £2,704; Edgeware Construction Co., £2,848; Wm. Abbott (Demolition), Ltd., £2,874; E. Gostling (Builders), Ltd., £2,917; Robertson, Collins and Jones, Ltd., £3,298; A. A. Williams (Contractors), Ltd., £3,466; Percy Bilton, Ltd., £4,652. Work commencing Jan. Wandsworth.—Construction of land drainage at Sir Walker St. John's School, for L.C.C.—S. R. Jones and Co., Ltd., Southminster. Essex, £2,935.

#### STREET LIGHTING

Bristol.—Supply of transformers for the 12 months ending 31/12/62, for City Council—Abacus Municipal, Ltd., Sutton-in-Ashfield, Notts.

Enfield, Middx.—Fixing and wiring of lanterns in connection with the first stage of the lighting programme, 1961-64 scheme, for

B.C.—Key Electrical Installations, Hedge Lane, London, N.13 (recommended).

B.C.—Key Electrical Installations, Hedge Lane, London, N.13 (recommended).

Epsom and Ewell, Surrey.—Erection and wiring of the 25ft, and 17ft. columns and auxiliary equipment, for the 1961-62 street lighting improvement scheme, for B.C.—Erecon, Ltd., Great Amwell, Ware, Herts., £1,765 (recommended); The General Electric Co., Ltd., £1,788; Harland and Wolff, Ltd., £2,847; Clough, Smith and Co., Ltd., £2,425.

Hastings, Sussex. — Erection of Helion lanterns on the Promenade lighting columns be ween London Road and the Cinema-de-Luxe as the first stage of relighting the whole of the Promenade, for B.C.—Revo Electric Co., Ltd., Tipton, Staffs. (recommended). Estimated cost £3,786.

Linlithgow, West Lothian.—Erection of 37 class B tubular steel lighting columns, together with the supply and erection of lanterns, lamps and gear, for B.C. James Flett, burgh surveyor. Thomas Laurie and Co., Ltd., Electrical Engineers, West End, Falkirk, £1,524.

Longbenton, Northumb.—Supply and erection of 144 class B lighting units, comprising group 4 of the street lighting conversion scheme, for U.D.C.—Eleco, Ltd., St. Albans, Herts. (recommended).

Sutton-in-Ashfield, Notts.—Supply and erection of 83 group B steel columns complete with lanterns and gear, for U.D.C.—Abacus Municipal, Ltd., Sutton-in-Ashfield, Notts.

#### GOVERNMENT CONTRACTS

Air Ministry.—Contracts to the value of £4,000 or over for the week ended Dec. 8:

Building work: Newton Point, Northumb.
—Stephenson (Builders and Contractors),
Ltd... Bishop Auckland, Co. Durham; Building work: Newton Point, Northumb.
—Stephenson (Builders and Contractors),
Ltd., Bishop Auckland, Co. Durham;
Kinloss, Morayshire—Scottish Tarmacadam,
Ltd., Glasgow, C.5; Cyprus—Cyprus Building and Road Cons.ruction Co., Ltd.,
Nicosia, Cyprus.
Stripping, re-sheeting and repairs to
hangers: St. Mawgan, Cornwall—Walter
Few and Sons, Ltd., London, N.5.
Surfacing work to existing paved areas:
Gibraltar—William Briggs and Sons, Ltd.,
Dundee.

Dundee.
Artificers work: Norton, Sheffield—R.
Green and Sons, Stockport.
Term painting: Stradishall, Suffolk—George Jones and Son (Contractors), Ltd.,
London, W.8.

Ministry of Works. — Contracts placed for week ended Dec. 2:

week ended Dec. 2:

Berkshire: Rocket Propulsion Establishment, Westco.t—granolithic topping to clearways—Kendell's Flooring, Ltd., 97 East Street, Epsom, Surrey.

Buckinghamshire: Telephone Exchange, High Wycombe—provision of prefabricated buildings and adaptations to existing building—George Begge and Son, Great Kingshill, High Wycombe, Bucks.; Chesham—erection of new telephone exchange—Clayton Heath, Ltd., Boyne Works, Maidenhead, Berks.

Glamorgan: Inland Revenue Office, Tyglas Road, Cardiff — internal decoracions — Norman Oldham, Ltd., 43 Brunswick Street, Canton, Cardiff.

Cumberland: Rocket Establishment, Spade-adam—further works—N. G. Bailey and Co., Ltd., Heathcote, Ilkley, Yorks.
Hampshire: Customs and Excise, No. 10 Station, Southampton Docks—erection of new office building—G. S. Hallum and Sons, Ltd., 9 Carlton Crescent, Southampton; National Gas Turbine Establishment, Pyestock—manufacture, tessing, etc., of eight water-cooled valves—Shipham and Co., Ltd., Hawthorn Avenue, Hull, Yorks.
Hertfordshire: Government Training Centre, Letchworth—internal decorations—Maurice Hill, Ltd., 5 Idol Lane, Eastcheap, London, E.C.3.
Lancashire: Risley—construction of H.M. Remand Centre—M. I. Gleeson (Contractors), Ltd., Haredon House, London Road, North Cheam, Surrey; Joint Office Premises, Warwick Road, Manchester—internal decorations—A. Pugh and Co., 236 Bolton Road, Salford, 6; Bolton—extension to Inland Revenue and Ministry of Pensions and Nacional Insurance building, Lever Chase, Ashburner Street—John Dickenson and Co. (Bolton), Ltd., Fairclough Street, Bolton: Nacional Assistance Board, Parthenon Drive, Norris Green, Liverpool—alterations—F. Parkinson, Ltd., Mowbray Drive, Blackpool.
London: Royal Agricultural Hall, N.I—additional work — Agate Electrical Engineers, Ltd., 42 High Street, Colliers Wood, S.W.19.
Middlesex: U.S. Air Forces Base, Ruislip, Teddington and Denham—alterations and adaptacions—E. Gostling (Builders), Ltd., St. Clare Works, Holly Road, Hampton Hill, Middx.
Monmouthshire: Pontypool—erection of automatic telephone exchange — W. E.

St. Clar Middx.

St. Clare Works, riony Road, Hampton Than Middx.

Monmouthshire: Pontypool—erection of automatic telephone exchange — W. E. Chivers and Sons, Ltd., Mill Lane, Western Avenue, Llandaff, Cardiff, Morayshire: South Street, Elgin—erection of Post Office Telephone Engineering centre Duncan Logan (Builders), Ltd., Muir of Ord, Ross-shire.

Shropshire: Albrighton—erection of Post Office Radio Station—M. A. Boswell (Contractors), Ltd., 124 Compton Road, Wolverhampton; Tern Hill—erection of H.M. prison—A. Monk and Co., Ltd., Padgate, Warrington.

prison—A. Monk and Co., Ltd., Padgate, Warrington.
Warwickshire: Post Office Factory, Fordrough Lane, Birmingham—erection new lock-up store—C. Green and Sons, Ltd., 61a Maypole Lane, Kingsheath, Birmingham, 14.

Post Office.—Contracts for duct laying, etc., works to the value of £4,000 and over placed during the week ended Dec. 9:

placed during the week ended Dec. 9:
George H. Graham (Contractors), Ltd.,
District Bank Chambers, Market Street,
Huddersfield, Yorkshire: The McNicholas
Construction Co., Ltd., 31a Cricklewood
Broadway, London, N.W.2; P. J. Maher, 12
Albert Park, Ashley Road, Bristol, 6; E. W.
Moulson and Son, Ltd., Forres.ers Yard,
High Street, Wibsey, Bradford,6; J. Murphy
and Sons, Ltd., 43 Charteris Road, Finsbury
Park, London, N.4; The North Midland
Construction Co., Ltd., Portland Works,
Daybrook, Noxtingham; The Norwest Construction Co., Ltd., Litherland, Liverpool,
21; George Taylor (Wolverhampton), Ltd.,
"The Viewlands," Cross Road, Albrighton,
Wolverhampton, Staffs.



# Talking of Safety "DRAGEE"

WALKED out of the site office and peered through the evening murk for the van that was to take me to a distant station. My own car was far, far away in an unfamiliar garage, which I had last seen gaily festooned for Christmas, and was probably even now echoing to a jolly crowd of mechanics who have just knocked off for the holiday and are merrily pouring something out of a dirty tin can into my radiator. . .

The van drew up suddenly. I shook hands with one or two of the staff, and climbed in beside the driver. We left with a slight backward shower of mud and an outcry of protest. It was dark, but I could imagine Simon grinning purchishly as he picked his way along the but I could imagine Simon grinning puckishly as he picked his way along the rough service track to the main road. We

turned south-east towards Birmingham.
Simon was the spare-time driver and a
more-or-less full-time messroom man. more-or-less full-time messroom man. Thin, dark and moody, some said he had gipsy blood in him, but Simon had always denied that vehemently. True, he had never in his young lifetime been able to produce a father, but his mother was a dark and handsome Welshwoman who had fended adequately for Simon and herself since he was a baby. He had no real ambition and only a tinge of bitterness. He had used his hands quietly and thoroughly at many unskilled jobs, here in the Black Country. He came to us when he returned to England and freedom in 1945.

Some specks of snow landed on the

Some specks of snow landed on the windscreen as we passed through the ourskirts of Stourbridge, the long rows of small red-brick houses shining starkly in

"Dragee," who is a practising safety engineer, would welcome subjects for discussion in this column. All names of persons mentioned in these discussions are entirely fictitious. Questions of law are expressed as the author's personal opinions and are not claimed to be authoritative.—EDITOR.

the headlights. "White Christmas" said Simon. "For anyone that likes it, You can leave me out." We moved on into the bleak waste-lands again, then over a steep hill into the chain-makers' town called Grindley Heath. The main street looked exactly like a dozen others we had passed through that evening, but this place was different: it was Simon's own home town He pointed towards the decorated Christmas tree in the tiny square, and a cluster of stalls shining with coloured lights and tinsel. "That's where my mam and I used to do

"That's where my mam and I used to do our Christmas shopping," said Simon. "Things were cheaper there than anywhere else, and that was important during

where else, and that was important during the big slump. Fortunately we only had to buy one present each—one for each other. We had nobody else, you see."

He was watching me, and I nodded casually without speaking. We rattled on, out of the lights, back into the forgotten world.

"Put we had one good laugh" he went

"But we had one good laugh," he went on. "It was the Christmas of 1930. I think one or two of the local pits were getting busy again—at least there was a little money going around, and my mam had her job in the tackle store. Early on Christmas eve we went to the market—we had bought the presents, but she wanted little extra food for the holiday. And was looking for Santa Claus."

It had stopped snowing, and he switched

It had stopped snowing, and he switched off the wiper.
"He wasn't a very good Santa, that one. He wasn't a very good Santa, that one. He wasn't cheapjack who pushed his barrowload of trinkets into the market every Christmas eve and sold the stuff by auction—you know how it goes. But to us kids he was a marvel. My mam used to explain the stall by saying he had to raise some money, otherwise where would the presents come from? That seemed to be reasonable enough. Except that he never came to our house, to our house.

"Well, this Christmas a new man came over with his barrow from Oldbury and

he was dressed up as Santa as well, you see. And of course that didn't suit this other Santa who'd had his pitch there for 10 years or more, so you can imagine they had a real set-to, right in the middle of Grindley High Street. They kicked and punched and tore at each other's clothes—I tell you it was a wonderful sight! The grown-ups were laughing their heads of grown-ups were laughing their heads off, but us kids could only stare at 'em, and then some started crying. You know how then some started crying. You know how kids are. This was beyond all understanding."

"I suppose it spoilt their Christmas for them?"

"It might well have done. They had precious little to look forward to in those days. But it was Big Harry that saved the situation. He had a fruit shop near the market and a reputation for meanness and black temper that kept most people away until they couldn't get credit anywhere also black temper that kept most people away until they couldn't get credit anywhere else. So out comes Big Harry and chases those two thieving merchants half way up to Gornal, then he comes back with a bundle under his arm. It's a Santa Clause outift, and he muta it is habited a stall with conand he puts it on behind a stall, with one of the beards he's picked up off the pavement. Then he goes into his shop and comes out with a big box of tangerines."

We were running into the outskirts of Birmingham, and I could see Simon smiling slightly, a dark curl over one eye.

"When he came out he called to all the

"When he came out he called to all the kids to gather round, then he started handing out tangerines—just one apiece, but free and for nothing. When it was my turn I could see he was scowling a bit. I thought is was because of the tangerines he was giving away, but I soon found out something else. When I looked round my man walking away, but I stayed behind was walking away, but I stayed behind.

was walking away, but I stayed behind.

"Next thing, he had got out his old gramophone and scratchy record with some carols, and pretty soon he got them all singing like mad. At least the grown-ups were—us kids were struck dumb with the wonder of it all. We weren't taken in, of course: we knew Big Harry all right, but this was something we didn't know about. And I knew something more than any of 'em."

We drew into the forecourt of the station and Simon stopped the engine. I glanced at Simon's thin profile again and wondered. . . . Christmas is a strange and mystical season, and some people are apt behave very oddly.

"How did you guess he was your father?" I asked at last.

Simon opened the door, then came round to meet me with my bag.

"I was the only one who got two tangerines," he said.

#### SIR GEORGE EARLE TROPHY AWARD

#### Certificates of Commendation

For the first time in the history of the Sir George Earle Trophy, Certificates of Commendation have been awarded to two organisations whose safety records were just short of the standard which enabled John Laing Construction, Ltd., to carry off Britain's top industrial safety trophy earlier

in the year.

The Adjudicating Panel was, however, impressed by the high standard of the entries received, and commended to the attention of the National Industrial Safety Committee of RoSPA the endeavours of the London Master Builders Association and the Woodall-Duckham Construction

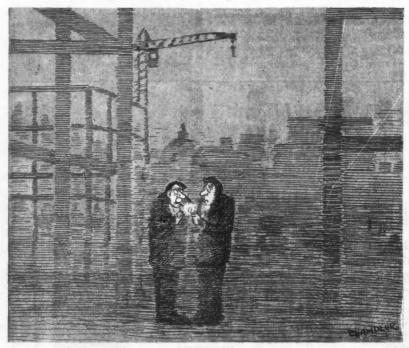
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and the Woodall-Duckham Construction.

The efforts of these two organisations have now been recognised by the award of Certificates of Commendation, and these were presented by RoSPA's president, Sir Howard Roberts, at an informal luncheon in London this week. The awards were received by C. A. Hart, C.M.G., T.D., D.Sc.(Eng.), M.I.C.E., F.R.I.C.S., director of the London Master Builders Association, and F. P. Dyson, M.I.C.E., joint managing director of the Woodall-Duckham Construction Co., Ltd.



"Foggy?—I should say so!—I've been working on the wrong site for another firm for three days!"

### WATES BEGIN 11-STOREY KENSINGTON **DWELLINGS**

#### Completion of Residential Development

WORK has just started on an Abbotsbury Road, Kensington, which will complete the luxury residential development on the Holland Park Estate for Maglan Property Co., Ltd.

Of reinforced concrete frame construction, the block will contain 37 flats and 24 garages. It will be founded on piles, and will be of the plate slab design, which dispenses with internal beams. Framework and foundations will be cast by the Modular Concrete Co., Ltd.

The ground floor will be an open concrete frame with load-bearing external columns which carry the upper storeys. This provides a covered "walkway" around the front perimeter of the building. At the basement level will be the boiler house, and some of the garages, pram stores and baggage stores.

The entrance foyer

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The entrance foyer will be formed by a will be formed by a rectangular clear glass screen erected within the concrete frame work. The building will be generally faced with buff-grey bricks with artificial stone copings. Ground floor columns and the precast balcony units will be finished with a coloured rendering. There will be four flats on each floor lave 965 sq. ft. of accommodation, consisting of two bedrooms, living room,

dining room, fitted kitchen, bathroom and w.c., and a secondary w.c. Each flat will also have a spacious private balcony, leading from the lounge, with a built-in flower box and wrought-iron ballustrades.

The building will be heated by an oilfired central heating system by means of skirting heating in the foyer and panel radiators in the flats.

Stone, Toms and Partners, 11 Farm Street, London, W.1, designed the development, and the main contractors are Wates, Ltd., London, S.W.16.



Artist's impression of the new block

#### EDINBURGH SAFETY GROUP'S COMPLIMENTARY DINNER FOR LECTURERS

THE Edinburgh and District Building Salety Group recently thanked its secturers for their work over the past season by staging a complimentary dinner at which officials of the group and those responsible for the safety training courses were hosts to their guest speakers.

Mr. John Henry, director of the Training Centre at Granton, welowed the guests and Mr. C. R. Noble, deputy superintending inspector of factories (Scot and) proposed the main loast during which he constatulated the group on the work it was doing to reduce accidents in the building industry.

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Mr. J. Valentine, chairman of the group, replied, thanking Mr. Noble and all others involved for their co-operation in the work. Mr. G. L. Caldwell, secretary of the group, toasted "The Guests" and paid particular attention to the assistance given by the Birmingham Centre in the launching of the Granton Training Centre.

Mr. P. B. Whitehouse of the Building Section, Birmingham Industrial Safety Group, replied on behalf of the guests. Seen here at the dinner are (left to right). Mr. John Henry; Mr. J. Valentine; Mr. P. B. Whitehouse; and Mr. J. V. Fairclough, British Engine and Boiler Insurance Co.,



#### "PLANNING FOR MAXIMUM PROFITS" CONFERENCE

MARKETING and producing for profit, control of overheads and effective management of assets will be discussed at a British Institute of Management one-day conference on "Planning for Maximum Profits". It will be held at the Connaught Rooms, London, W.C.2, on Thursday, January 11, 1962, from 9.45 a.m. to 5 p.m., and is intended for directors, senior managers and accountants. agers and accountants.

agers and accountants.

Speakers will include Mr. H. L. Bingham, director and financial controller, Viscose Division, Courtaulds, Ltd., who will examine the most effective use that can be made of available resources at a time of shortage of capital, aggravated by the credit squeeze; Mr. W. J. Lloyd, managing director, Wood Hall Trust, Ltd., will discuss how to sell at the right price, the right kind of products in the right market, and a Paper on the most economic employment of plant, material and labour will be given by Mr. D. L. Nicolson, managing director.

of plant, material and labour will be given by Mr. D. L. Nicolson, managing director, Production-Engineering, Ltd.

How overheads can be controlled without hindering growth and development at a time when automation and rising prices bring a rapid increase in costs will be examined by Mr. H. H. Norcross, managing director, Norcross and Partners, Ltd.

The chairman of the conference will be Mr. R. F. Hunt, deputy chairman, Dowty Group, Ltd.

# N.F.B.T.E. TRAVELLING SCHOLARSHIP FOR RESEARCH

The National Federation of Building Trades Employers is to award annually a Travelling Scholarship to the value of up to £250 for research into organisation, methods and procedures in the building industry abroad.

industry abroad.

The scholarship will be open to candidates normally resident in the United Kingdom who obtain outstanding results in the Part II Final Examination of the Institute of Builders. They may be employees of building firms (N.F.B.T.E. member firms or otherwise) or of building departments of public or local authorities, building teachers or research workers. Final selection will be by interview.

The holders of these scholarships, the

Final selection will be by interview.

The holders of these scholarships, the first of which will be awarded on the results of the I.O.B. Final Examination due to be held in June next, will be required to take up their scholarships within 12 months of the award, to spend at least four weeks abroad and to submit a report on their studies. Subjects and locations for study will be suggested annually by the suggested annually

#### PROTECTION OF STRUCTURAL STEEL AGAINST FIRE

The Joint Fire Research Organisation frequently receives inquiries from manufacturers, consultants, architects and local authorities about methods of fire protection for steel columns and beams.

"Protection of Structural Steel Against Fire" by G. Bird, B.Sc.(Eng.), M.I.Mech.E., (published for D.S.I.R. by H.M.S.O. price 2s., by post 2s. 4d. U.S.A. 36 cents.), summarises practical methods of protection which can be used by the building industry for a wide range of constructions. structions.

It is based on a similar series of large-scale tests to those described in the recent Fire Note No. 1. These have been carried out in connection with British Standard 476 which grades structural elements by their ability to perform the functions for which they were designed, when exposed to fire.

Ways of achieving the BSI requirements by "solid" and "hollow" protection are described, together with recent developments in the use of lightweight insulating materials.

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#### FOR THE DIARY

Meeting of Manchester and District branch of the Contractors' Mechanical Plant Engi-neers, Woodcourt Hotel, Brooklands Road, Sale. 7.30 p.m. General discussion.

#### Jan. 9

Meeting of London branch of the Institution of Plant Engineers, Royal Society of Arts, London. 7 p.m. "Fire Research—Causes and Control," by Dr. F. E. T. Kingman, assistant director, Fire Research Centre.

Meeting of the Institution of Civil Engineers, Great George Street, London, S.W.I. "Selsey Coast Protection Scheme," by J.

#### Jan. 11

meeting of the Institution of Structural Engineers, 11 Upper Belgrave Street, London, S.W.l. 6 p.m. "Structural Engineering Aspects of the Millbank Tower Block, London," by Colin Davies.

Meeting of the Institution of Civil Engineers, Great George Street, London, S.W.l. Informal discussion, introduced by J. D. Bibby, on "Construction Methods and Problems of Tall Buildings."

Meeting of the Institution of Civil Engineers, Great George Street, London, S.W.l. "Use of the Plastic Theory in the Design of a Fabricating Shop." by Prof. Sir John Baker, M. R. Horne and L. G. Johnson.

Annual general meeting of the South Western Federation of Building Trades Employers, Taunton.

Meeting of the Reinforced Concrete Association, at 4 Hamilton Place, London, W.I. "Tall Buildings in Concrete—in situ and precast"—Millbank Tower (by G. W. Kirkland and D. M. Fountain) and Hide Tower (by C. Weiss and W. Pitman).

Meeting of the London branch of the Contractors' Mechanical Plant Engineers, Red House Hotel, Redbridge, 7.30 p.m. Meeting of the Traffic Engineering Group at the Institution of Civil Engineers, Great

George Street, London, S.W.1. Informal discussion, introduced by R. L. Moore, on "Directional Traffic Signs."

Meeting of the Road and Building Materials Group at the Society of Chemical Industry, 14 Belgrave Square, London, S.W.I. "Mix-tures of Tar and Bitumen as Road Binders," by members of the staff of Road Research Laboratory, D.S.I.R.

Meeting of Midlands branch of the Con-tractors' Mechanical Plant Engineers, Wilson Arms, Knowle. Film: "Ascot Grandstand."

#### Jan. 23

L.M.B.A. annual general meeting and lunch, Park Lane Hotel.

Meeting of the Institution of Civil Engineers, Great George Street, London, S.W.I. "Noise at Airports," by Prof. E. J. Richards.

Meeting of the Institution of Civil Engineers, Great George Street, London, S.W.I. Dugald Clerk Lecture: "Mechanisation of Civil Engineering," by W. K. Laing.

Meeting of the Institution of Structural Engineers, 11 Upper Belgrave Street, London, S.W.1. 6 p.m. "The Proposed Bridge over the English Channel," by Dr. A. R. Flint.

Meeting of the Institution of Civil Engineers, Great George Street, London, S.W.1. Informal discussion, introduced by B. G. Combridge, on "The Effect of Road Works on Traffic Flow."

Master Plasterers Association general meeting, Charing Cross London

Annual general meeting of the South Wales Federation of Building Trades Employers, Cardiff.

Annual dinner and dance of London branch of the Contractors' Mechanical Plant Engi-neers, Criterion Restaurant. Piccadilly.

#### Jan. 30

Meeting of the Institution of Civil Engineers, Great George Street, London, S.W.I. "The Design, Construction and Testing of a Pres.ressed Concrete Reactor Pressure Vessel Model," by Prof. A. L. L. Baker, M. L. A. Moncrieff, I. W. Hannah and S. Gill.

"Mechanical Equipment for Sewage Puri-fication Works" symposium at the Institu-tion of Mechanical Engineers, I Birdcage walk, Westminster, London, S.W.I.

Meeting of Manchester and District branch of the Contractors' Mechanical Plant Engi-neers, Woodcourt Hotel, Brooklands Road, Sale. 7.30 p.m. Film show by Blaw Knox, Ltd.

Annual dinner of the National Federation of Building Trades Employers, Grosvenor House, London.

Annual general meeting of the National Federation of Building Trades Employers R.I.B.A., Portland Place, London, W.I. 10.30 a.m.

Annual dinner of the Institute of Builders, Guildhall, London. 7.15 p.m.

Meeting of the London branch of the Contractors' Mechanical Plant Engineers, Hendon Way Hotel, Hendon, 7.30 p.m.

Meeting of Midlands branch of the Con-tractors' Mechanical Plant Engineers, Wilson Arms, Knowle. "Broad Aspects of Main-tenance of Contractors' Plant," by J. H. Brass, John Mowlem and Co., Ltd.

Annual dinner of the Institution of Plant Engineers, Connaught Rooms, London.

Meeting of Manchester and District branch of the Contractors' Mechanical Plant Engi-neers, Woodcourt Hotel, Brooklands Road, le. 7.30 p.m. "Brains Trust."

#### 75FT. SPAN TRAVELLING GANTRY AIDS OXFORD **BRIDGE CONSTRUCTION**

A TRAVELLING gantry with a span of 75ft. and made up of Bailey bridge units is being used to solve the problem of lifting and placing the 22-ton precast concrete beams on the City of Oxford's new Donnington Bridge.

The purpose of the gantry is to pick up the centre beam sections, either singly or in pairs, which were floated into the river on Bailey pontoons. The beams had to be placed very accurately on a pre-assembled temporary trestle. This will support them until the outer sections of the arch are completed, when the whole arch will, of

completed, when the whole arch will, of course, become self-supporting.

The gantry and trestling was designed and supplied on hire by Mabey and Johnson, Ltd., 54 Victoria Street, London, S.W.I. Main Contractors are the Cementation Co., Ltd., and the consulting engineers are Travers, Morgan and Partners.

#### SCOTTISH TRADE DELEGATION RETURNS FROM POLAND

Members of the Scottish Trade Delega-

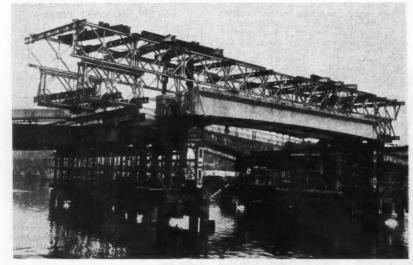
Members of the Scottish Trade Delegation to Poland have returned to the United Kingdom after a successful week of discussion with the Polish foreign trading enterprises in Warsaw and Katowice, A sequel to an experimental mission to Eastern Europe undertaken in September under the auspices of the Scottish Council (Development and Industry), the visit was aimed at investigating the possibilities for building complete plant on a consortium building complete plant on a consortium basis and at pin-pointing particular oportunities for Scottish-made engineering plant.

included Mr. The mission included Mr. Walter Khoring, technical and development director of Motherwell Bridge and Engineering Co., Ltd.; Mr. Hugh Arbuthnot, managing director of North British Locomotive Co., Ltd.; Mr. Andrew C. Smith, sales director, G. and J. Weir, Ltd.; Mr. R. Keir Watson, a director of Imex Engineering, Ltd., representing Brown Brothers and Bruntons of Musselburgh; and Mr. G. B. Young, London secretary of the Scottish Council, who had taken part in the earlier mission. The mission the Scottish Council, in the earlier mission.

#### GLARE DANGER IN NEW **SCHOOLS**

An investigation into the effects of An investigation into the effects of excessive glare in schools that use large expanses of glass is to be carried out by the Medical Research Council. This follows criticism of the excessive use of glass in new schools made by the Ministry of Education's Estimates Committee in

The Council will consider whether any impairment of vision results from excessive glare and will study the effects of overheating from the sun.



Gantry and trestling on Donnington Bridge

### RESURFACING OF GOODWOOD MOTOR RACING CIRCUIT COMPLETED

Some unusual problems were met on the resurfacing of the 2.4 mile Goodwood motor racing circuit in West Sussex. Work on the triangular-shaped track, which was developed from the perimeter roadway of a war-time satellite airfield, has recently been com-pleted by The Limmer and Trinidad Lake Asphalt Co., Ltd.

Jake Aspnait Co., Ltd.
Specific requirements for the new surface were that it should have high anti-skid properties under wet conditions combined with the minimum abrasive action, causing tyre wear at high speed, in the dry.

From test mixes, a low temperature

weather was expected and duly arrived. The major problem then outstanding was to get simulated heavy traffic conwas to get simulated heavy traffic conditions on the new surface once re-laying started. This was overcome by the use of an Aveling - Barford type PTR hydraulically-operated roller of Road Rollers, Ltd. This pneumatic-tyred machine working at 8½-tons pressure and a speed of some 3 m.p.h., compacted any open texture in the asphalt and closed up joints.

The working train on the job was a Barber-Greene spreader followed by a consideration.

Barber-Greene spreader followed by a conventional steel-wheeled, 6-ton road roller, and then the grit-ballasted nine-wheeled pneumatic-tyred roller.



The Aveling-Barford roller in action

asphalt combining closely graded Cornish

asphalt combining closely graded Cornish ganite with non-polishing grit stone was selected, this following practical and technical tests carried out by the Dunlop Racing Division and the Road Research Laboratory of the D.S.I.R.

Before the 50,000 sq. yd. of the circuit were covered with a \$\frac{1}{2}\text{in}\$, deep coating of the resurfacing aggregate, much of the old surface was burned off, bad joints cut out and packed with \$\frac{1}{2}\text{in}\$, base course, sections of the track levelled to aid drainage. out and packed with 4th. base course, sections of the track levelled to aid drainage, and a cationic tack-coat put down. This latter treatment was advisable in view of the prevailing weather conditions when wet

The mix was delivered from the southern area depot of The Limmer and Trinidad Lake Asphalt Co., Ltd., at Cosham, at a temperature of between 150 degrees to 200 degrees F., and work went on in all but the heaviest rain conditions. The compacting action of the pneumatic tyred roller was

ing action of the pneumatic tyred roller was such that the surface was difficult to shift with a pick-axe 30 minutes after being laid.

Total working time for resurfacing the Goodwood track was a little over three weeks, the amount of material used, approximately 2,000 tons, and the overall cost for all aspects of the job was just over

### SOUTH AFRICA'S GIANT RADIO MAST

WORK is nearing completion on one of WORK is nearing completion on one of the world's tallest radio masts, in lohannesburg, as part of an expansion scheme of the South African Broadcasting Corporation. The first stage of the scheme involves four Frequency Modulation (VHF) stations, one each at Pretoria, Johannesburg, Rustenburg and Potchefstroom. The Johannesburg tower is 755ft. from ground level to the top of the mast. It is self-supporting, not being guyed. It is reinforced concrete construction up to

in reinforced concrete construction up to a level of 593ft, above ground. The shape varies and is a development of a shuttering

stem proposed by the contractors— Christiani and Nielsen (SA) Pty., Ltd.

The walls of the tower shaft vary in thickness, being approximately 18in. at gound level and 9in. at the top. Between the levels of 553ft. and 593ft. above ground a three-tier observation plactorm is being a three-tier observation platform is being built where the public may enjoy the view. It will be served by a high-speed lift. From a level of 593ft. above the ground to the top of the mast a structural steel, foursided lattice - work supports the aerials.

The total cost of the project is £150,000, excluding the lift. Consulting engineers are the Johannesburg branch of Ove Arup and Partners of London, a member-firm of the Association of Consulting Engineers, who are collaborating with Mr. H. O. Collett, chief engineer, and Mr. Leslie Durston, chief architect to the African Broadcasting Corporation.

LORRY MOUNTED CRANE

LORRY MOUNTED CRANE
ASSOCIATION'S MEETING
The autumn general meeting of the
Lorry-Mounted Crane Association was held
in London recently.
Discussion ranged over a wide field and
a technical committee was formed consisting of qualified engineers and members
with field experience.

It was decided to hold the annual general
meeting in London in May, 1962, on a
date which would enable members to visit
the Mechanical Handling Exhibition.

### ARMY LECTURE THEATRE BUILT AT CAMBERLEY

A NEW Army lecture hall and theatre, with seating for 390, has been constructed at the rear of the Staff College, Camberley.

The building, called the Alanbrooke Hall, is of steel and reinforced concrete construction on pile foundations. The exposed concrete is bush-hammered and the walls are of fair-faced brickwork. The

front is of curtain walling.

A feature of the interior decoration is the use of about 10,000 sq. ft. of Weyroc wood chipboard for wall panelling in the stair wells and for the suspended ceiling

stair wells and for the suspended ceiling in the main hall.

The 850 panels of chipboard were manufactured by The Airscrew Company and Jicwood, Ltd., Weybridge, Surrey, and were cut to size and machined to specification, which included the drilling, chamfering and provision of lighting apertures and all edges were sealed prior to the delivery of the panels to the site.

A War Office stipulation was that the design of the building should enable construction to be completed within 13 months after work commenced on the site. This was achieved.

was achieved.

The architects were A. M. Gear and Associates, 12 Manchester Square, London, W.1., and the main contractors were Wilson, Lovatt and Sons, Ltd., 16 W.I., and the main contractors were Wilson, Lovatt and Sons, Ltd., 16 Grosvenor Crescent, London, S.W.1.

### MASTER BUILDERS' LADIES' **NIGHT**

The London Region of the Federation of Master Builders recently held their Ladies' Night at Grosvenor House, Park Lane, when there were over 1,100 members and guests present.

Lane, when there were over 1,100 members and guests present.

The chair was occupied by the regional president, Mr. S. C. Parrish, who was accompanied by Mrs. Parrish; also present were the national president, Mr. R. W. Ricketts, with Mrs. Ricketts. Amongst the guests were Mr. R. Graham Page, M.P., and Mrs. Page, Sir George McNaughton, president of the Institution of Civil Engineers, with Lady McNaughton; Mr. J. Gowing Middleton, president of the Institute of Builders, and Mrs. Middleton; Mr. Austin Taylor, chairman of the Timber Development Association, and Mrs. Taylor; Mr. T. Walter Saint, the Federation's honorary solicitor, and Mrs. Saint; and Mr. E. L. Jones, the London Secretary of the N.F.B.T.O., and Mrs. Jones.

The evening marked the beginning of the celebration of the 21st anniversary of the formation of the Federation of Master Builders.

### 1961 CHARLES HAWKSLEY PRIZE WINNER

The Institution of Civil Engineers have awarded their "Charles Hawksley Prize" for 1961 to Mr. A. R. Burton of Margate.
The prize is an annual competition, combining aesthetic merit and sound engi-

neering design, open to students, graduates and Associate Members of the Institution

and Associate Members of the Institution under 30 years of age.

Mr. B. T. Keay, of High Wycombe, Bucks, was second; and third position went to Mr. I. G. Heggie, of London, and Mr. P. J. Baker of Streetly, Staffs.

The prize-winners—all graduate members of the Institution of Civil Engineers—were awarded £150, £100 and £25 representingly.

Engineers—were awarded £150, £100 and £25 respectively.

Competitors had to submit designs of either a cooling tower in reinforced concrete or thin shell roofs for a community centre to serve a small town. The winner selected the cooling tower.

### 1962 Competition

Competitors for 1962 have the choice of three subjects—a colliery winder tower, a pipe bridge across a river, or a reactor building for a nuclear power station. Full details can be obtained from the Secretary of the Institution of Civil Engineers.

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### PROGRESS BY EXPERIENCE Hydro Improvement Works

A GREAT deal of valuable experience A has been gained and some entirely new techniques have been acquired as the result of making improvements to three Scottish hydro-electric schemes
—Foyers, Kinlochleven and Lochaber,
completed 67, 50 and 35 years ago respectively.

respectively.

This was stated recently at the Institution of Civil Engineers in London, in a Paper presented by Mr. H. D. Morgan and Mr. D. D. R. Thomas on "Maintenance of Hydro-electric Schemes and the Development of Sidestream Intakes." It dealt with the civil engineering maintenance of these

Hydro-electric Schemes and the Development of Sidestream Intakes." It dealt with the civil engineering maintenance of these three hydro-electric schemes of the British Aluminium Co., Ltd., in Scotland.

"The fact that they have given continuous service for 67, 50 and 35 years respectively, speaks very well for the design of the works," said the authors, "particularly when it is recalled that great advances in civil engineering technology have taken place since those early years."

They pointed out that the duty that each of these installations has to perform is different from that carried on by other hydro-electric installations in that the power is used to supply continuous-process electro-chemical reduction furnaces. Continuous supply of power is essential, and this renders any large-scale maintenance work most difficult and complicated because of the necessity to keep the installation in operation throughout. Any shutdown is a most costly matter.

Production not Affected

### Production not Affected

The authors said that to repack a gland in one of the main sluice valves at Lochaber would put half the factory out of production. When it has been necessary to rebore the hydraulic operating cylinders of three of the main valves at the top of the pipelines, the valves were kept open by holding up the doors on an overhead crane and production was not affected.

### PLASTERING CONTRACTORS ELECT OFFICERS

At the 12th annual general meeting of the National Federation of Plastering Contractors, the following were elected as officers for 1962: President, Mr. F. Bailey (Lancaster); senior vice-president, Mr. C. W. Pool (London); junior vice-president, Mr. R. R. Hitchins (Gloucester); immediate past-president, Mr. G. J. Foreman (Slough); hon. treasurer, Mr. H. Humber (London).

### MINISTER PRAISES BARBICAN SCHEME

DR. CHARLES HILL, Minister of Hous-D ing and Local Government, said in London last week that the Barbican scheme would make a twofold contribution to the problem of easing congestion in the City. Over 2,000 new residents would be saved long journeys to work, and further congestion would be avoided by building homes and other property in the right proportions.

The Minister, who was speaking at the Barbican Committee dinner in the Guild-hall said: "Fascinating though the sheer size of this development may be—and from the point of view of the professional man, builder, or developer it must be the event of a lifetime—yet to people who look to the future the main attraction must be that the heart of London will be given new life.

new life.

"It is not enough to be teeming with life during the day and a city of cats and caretakers by night. And it wouldn't be good enough, either, to have used this battered area purely for commercial purposes, only to draw more thousands of workers along the congested routes to the

City.
"With admirable foresight you are about

"With admirable foresight you are about to produce a residential area which will be the pride of the second half of the 20th century in this part of the world—a business centre during the day, a living community outside working hours."

Pointing out that the new shapes and higher buildings on London's skyline which the Barbican development would bring about would bring criticism from people "who love the lowish outline of London", Dr. Hill said: "With the greatest goodwill in the world I say to these people that London must increasingly depend upon making greater use of every available acre."

### NEW COURSES AT BRIXTON SCHOOL

Courses on "Work Study Appreciation" and "Formwork and Shuttering" are to be offered by the Brixton School of Building the commencement of the new

Both courses comprise 10 weekly lectures, the fee for each being £1. The work study course starts on Monday, January 8, and the formwork course on Monday, January 15. Applications to attend should be addressed to the Head of the Building Department, Ferndale Road, London, S.W.4.

### CONSTRUCTION EQUIPMENT EXPORT RECORD

S PEAKING at the annual dinner of the Federation of Manufacturers of Construction Equipment, held in London recently, the Parliamentary Secretary to the Board of Trade, Mr. Niall Macpherson,

"I would like to congratulate the whole industry on your export performance. Your sales last year were up by more than one-third in comparison with 1957, and this year in nine months you had already surpassed your record of 1960.
"Exports do not come by accident we

"Exports do not come by accident. You have set out deliberately and with determination to expand sales in Europe, and mination to expand sales in Europe, and you have gained a very respectable share of the market. In an area of rapidly expanding prosperity and considerable shortage of labour, your wares are naturally in great demand. As everyone knows we are of labour, your wares are naturally in great demand. As everyone knows, we are at present negotiating for entry into the Common Market. It is certainly in your interest that the negotiations should succeed; for otherwise you will be placed at an increasing disadvantage vis-a-vis your competitors on the continent, as the member countries of the E.E.C. progressively remove their tariffs from each other's industrial products.

"Moreover you have already formed the habit of co-operation with the association of manufacturers of construction equipment of the Six—I am told it works well. You are already one of the European family.

family.

family.

"Not that your only export markets are on the continent of Europe—far from it. Vast schemes of construction are taking place all over the world, many of them with the object of raising the standard of living of underdeveloped countries. Come what may your opportunities for developwhat may, your opportunities for development are very promising, for the scope for development is immense. I know that you are constantly on the watch for them, and are by no means shy about letting the rest of the world know what you can offer."

### PAKISTAN ORDER FOR NCK-RAPIER

An order from the East Pakistan Water d Power Development Authority for and Power Development Authority for 15 crawler-mounted draglines and three truck-mounted cranes has been received by NCK-Rapier, Ltd., 32 Victoria Street, London, W.I. The order is worth over London, £260,000.

£260,000.

The machines are the first to be sold to East Pakistan for several years and are being purchased through a United Kingdom loan to the East Pakistan Government Distributors for NCK-Rapier in Pakistan are the International Farm and Earthmoving Equipment Co., Karachi and Dacca.

### TRAINING COURSES IN CONCRETE

### C. and C.A.'s 1962 Programme

THE Cement and Concrete Association have announced details of the courses to be held during 1962 at the Wexham Springs (Bucks.) training centre and research station. The programme is as

January 8-12 and November 26-30—Design of prestressed and reinforced concrete bridges

engineers. for engineers.
February 12-16, September 10-14 and
September 17-21—Structural concrete I—a
general course for engineers.
October 29-November 2 and November 5-9
—Structural concrete II—an advanced course

—Structural concrete II—an advanced course on design for engineers.

January 29-February 2, February 5-9 and July 23-27—Concrete technology I—a general course for engineers.

October 22-26—Concrete technology II—an advanced course for engineers.

January 22-24—Concrete technology for ready-mixed concrete suppliers.\*

April 2-6 and April 9-13—Concrete roads and cement-stabilised bases I—a general course for engineers.

June 25-29—Concrete roads and cement-stabilised bases II—an advanced course for engineers.

engineers.
July 2-6—Concrete roads and cement-stabilised bases for general foremen, clerks of works and highway superintendents.

April 30-May 4, May 7-11, July 9-13 and July 16-20—Concrete construction for general foremen and clerks of works.

November 12-16 and November 19-23—Structural concrete for general foremen and clerks of works.

Structural concrete for general foremen and clerks of works.

May 14-18—Concrete construction for builders and estate developers.

May 21-25—Concrete construction—an introductory course.

February 19-23, February 26-March 2, March 5-9, March 12-16, March 19-23, March 26-30, September 24-28, October 1-5, October 8-12, and October 15-19—Concrete construction for gangers.†

January 15-19—Concrete products.‡ December 3-6—Aggregates for concrete.§
May 28-June 1, June 4-8 and June 18-22—
Concrete for architects.
September 3-7 — Summer School for

### £1,250M. ON GERMAN **AUTOBAHNS**

The West German Government are to spend about £1,250 million on 1,000 kilometres of new autobahns in the four-year period from 1963. This was announced by the Federal Minister of Transport at the recent annual meeting of Motor Traffic Enterprises in Cologne.

### **Obituary**

It is with regret that The Contract Journal records the death of the following.
Mr. J. A. Howell, who retired recently after 33 years as a divisional surveyor with Berkshire C.C. His last post was as a divisional surveyor at Abingdon.
Mr. Horace W. Pochin, chairman of Standard Engineering Co., Ltd., Leicester.
Mr. Eric Stanley Sunderland, aged 50, deputy county architect of Kesteven. He was an associate of the R.I.B.A. and was chairman of the Lincoln branch of the Nottingham, Derby and Lincoln Society of Architects.

Limited to employees of members of the British Ready Mixed Concrete Association; application should be made through the Secretary of the 8.R.M.C.A. Application should be made through the National Federation of Building Trades Employers or the Federation of Civil Englneering Contractors. Limited to employees of firms subscribing to the Research Committee of the Cast Stone and Cast Concrete Products Industry.

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### NEW CRAWLER-MOUNTED DRILLING RIG ANNOUNCED BY C.P.

A WIDE range of drilling duties can be tackled by a new crawler-mounted self-propelled drilling rig which has been developed by the Reichdrill Division of the Consolidated Pneumatic Tool Co., Ltd., 232 Dawes Road, London, S.W.6.

The drill utilises a hydraulically operated rariable speed drill rotation motor and a rariable hydraulic thrust mechanism for use with either an in-the-hole hammer for blast holes of 4½in, to 5in, diameter or a

The drill is powered by a Ford Dexta three-cylinder diesel engine which develops 25 b.h.p. at 1,450 r.p.m. Alternatively a Sutton Power Pack may be fitted. The output from the engine is to a Triple Deri-Syne hydraulic pump through a Renold chain coupling, these pumps operating in parallel and giving a system pressure of 1,750 p.s.i., for the operation of the mast positioning cylinders, drill rotation motor and self-propelling mechanism. A CP.365-RO-2 rotary "Power Vane" compressor is towed behind the drill to provide

Consolidated C155 Reichdrill

rotary bit for holes of  $2\frac{1}{2}$ in, diameter in hard formations and up to  $6\frac{1}{2}$ in, diameter in soft rocks and alluvium. Thus in addition to general blast hole work, the drill is suitable for specialised work such as deep drilling for grouting or for anchorages in hard rock or concrete in addition to prospecting in alluvium and for well-boring when used in conjunction with a 6in. diameter casing.

air power for the in-the-hole hammer and

air power for the in-the-hole hammer and for air flushing.

The frame is carried on two Bristol crawler tracks which have 10in, pads at 5ft, centres, the overall length of the tracks being 8ft. 3in. These tracks are operated by a hydraulic motor, driving through a Croft totally enclosed torque arm reduction gear box, the drive shafting being carried in a ball-bearing pillow block. A

strap brake is provided on each track and to enable the drill to manoeuvre into posi-tion over rough terrain, an 8in, rise and fall in each track is obtained by articulation, actuated through the transverse swivel

mast carrier bracket is welded to the leading end of the drill frame, the bracket carrying a swivel plate in which the drilling carrying a swivel plate in which the drilling mast is held. This swivel plate which is operated by a double acting hydraulic cylinder of 4in. bore, the piston having a stroke of 11in., swings the mast through a maximum of 160 degrees. Carried through the bracket is a further ram of 4in. bore and 16in. stroke which raises the mast from the retracted travelling activities. mast from the retracted travelling position. The mast is of channel construction, having bar slides to carry a hydraulic rotary head mechanism and having a fixed drill table

at its base.

A feature of the drill is the block and tackle principle used for the thrust mechanism in which a hydraulic cylinder and piston, with a working stroke of 5ft. 6in. is used in conjunction with a pulley system having a velocity ratio of two. This gives an effective working stroke of 11ft. and can be operated at up to 40ft. per minute for quick removal of drill stems. Thrust control is obtained by a pressure control valve and a built-in pressure gauge on a control panel on the drill frame, where all the Vickers control valves and locking needle valves are located.

Rotary Head Medical Control of the control valves and locking needle valves are located.

### Rotary Head Mechanism

The rotary head mechanism which provides a variable degree of torque to the drill stem, consists of a hydraulic motor and a direct driven gear box, normal maximum torque is 10,500lb. A Vickers check valve is incorporated in the circuit to the hydraulic motor to short circuit the oil back to the feed tank in the event of an excessive pressure rise due to the motor stalling.

an excessive pressure rise due to the motor stalling.

The high torque conditions obtainable with this drill have led to the 10ft. length hollow drill stems being fitted with screw joints of special alloy steel. For pressure drilling, a 50 r.p.m. rotary head motor is employed with in-the-hole hammers for holes of between 4½in. and 5in. diameter. For use with A size diamond drill rods a 150 r.p.m. head is fitted for rotary drilling of holes of 2½in. diameter. Drill stem handling is facilitated by a power "break out" hydraulic cylinder which can be operated to give leverage to a parrot be operated to give leverage to a parrot

### IMPROVEMENTS TO B.M.C. PRIME MOVER

improvements mechanical specification have been made on the forward-control Austin and Morris 12/15-ton G.T.W. prime mover for the 1962 model.

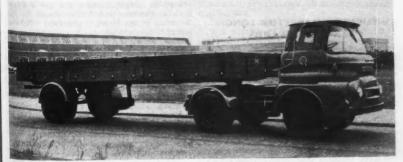
These concern the chassis frame, the wheelbase of which is increased by 10in. from 7ft. 1in. to 7ft. 1lin. to effect an improvement in driver comfort when travelling uncoupled or with a lightly laden semi-trailer.

The thickness of the frame has been

increased from \$\frac{1}{6}\$in. to \$\frac{1}{4}\$in. and the depth from \$7\frac{1}{2}\$in. Another change is the replacement of the 17gal. fuel tank by a 26gal, unit, which increases the safe cruising range from around 180 miles to 280 miles on diesel versions and from 120 miles to 190 miles on petrol versions.

These are the first significant improvements to be incorporated in this B.M.C. prime mover design since its inception in 1955, although the new five-speed gearbox

1955, although the new five-speed gearbox was introduced as an optional extra



B.M.C. 12/15-ton G.T.W. prime mover

### COMPANIES TO MERGE

Eggar, Forrester and Verner, Ltd., and British Overseas Engineering and Credit Co., Ltd., have agreed to combine their interests. The past shareholders of B.O.E.C.C., Ltd.—Taylor Woodrow, Ltd., Hambros Bank, Ltd., and N. M. Rothschild and Sons—now hold shares in Eggar, Forrester and Verner, Ltd., who have become the parent company.

Forrester and Verner, Ltd., who have become the parent company.

Mr. J. R. Ropner is to be chairman of Eggar, Forrester and Verner, Ltd. and Mr. S. E. A. Kimmins joins Mr. P. D. R. Talbot Willcox as joint managing director. Mr. J. V. Ropner, Mr. W. G. D. Ropner, Mr. L. D. de Rothschild and Mr. E. J. Woolf all join the board of Eggar, Forrester and Verner, Ltd.

The directors of BOE C. C. Ltd. will

The directors of B.O.E.C.C., Ltd., will now be Mr. J. R. Ropner, chairman, Mr. S. E. A. Kimmins and Mr. P. D. R. Talbot Willcox joint managing, Mr. H. J. Burns, Mr. G. B. Naylor, Mr. L. D. de Rothschild, Mr. A. Schwarz and Mr. E. J. Woolf.

### FORD SALES CONFERENCE

Twenty-seven delegates from 19 countries, representing Ford companies from all over the world, attended the third International Industrial Engines Sales Conference held in London recently by the Industrial Engine Division of the Ford Motor Co. Ltd. Ford Motor Co., Ltd.

### Trade and Company News

### CRANES FOR GREENOCK **GRAVING DOCK**

GRAVING DOCK

BUTTERS BROS. AND CO., LTD., McLellan Street, Glasgow, S.1, have received a contract from the Firth of Clyde Dry Dock Co., Ltd., for the supply of four level luffing dockside cranes for the new graving dock at Greenock.

The contract is for two 60-ton and two 15-ton electric travelling level luffing cranes. The 60-ton cranes are capable of lifting the full load at 125ft. radius to a height of 160ft. above the track level. At the maximum radius of 185ft. they lift loads up to 20 tons. Each is fitted with an auxiliary hoist capable of lifting 5 tons at 195ft. radius. The towers are 80ft. high and the cranes run on a rail track set at 40ft. centres. 40ft. centres.

The 15-ton cranes are generally similar in design and are capable of lifting 15 tons to a height of 160ft. at 135ft. radius. The contract is due for completion at the end of 1963.

### ALLEN PUMPS FOR MALAYA

ALLEN PUMPS FOR MALAYA
An order for four 27in. vertical-spindle, double-suction, centrifugal circulating-water pumps has been placed with W. H. Allen Sons and Co., Ltd., Bedford, by Aiton and Co., Ltd., on behalf of the Central Electricity Board, Federation of Malaya.

The pumps, which are for the Johore Bahru Power Station, will each have a duty of 13,000 galls/minute against a total head of 34ft. when running at 585 r.p.m. They will be close-coupled to 175-h.p., 3.3-kV Allen totally-enclosed, fancooled, squirrel-cage motors. Consulting engineers for the contract are Preece, Cardew and Rider, 8-10 Queen Anne's Gate, Westminster, S.W.1.

### SNAP FIT DUCTING UNIT

SNAP FIT DUCTING UNIT
Halcrete (Precision) Panels, Ltd.,
Stockley, West Drayton, Middx., have
produced a snap fit ducting unit in
exposed or asbestos faced wood wool,
which completely conceals the conduit
runs for electric lighting or water
sprinklers. The ducting ensures that the
conduit is below the insulation, but is
readily accessible at any time, should
alteration to layout of the electric lighting
become necessary. become necessary.

### McALPINE ORDER 30-TON **DUMPERS**

Aveling-Barford 30-ton Four Aveling-Barford 30-ton SN dumpers have been ordered by Sir Alfred McAlpine and Sons, Ltd., for operation at the Crow's Nest opencast coal site, near Wigan. Other recent orders for this type of vehicle have included two for R. A. Davies (Midland), Ltd., and two for British Portland Cement Manufacturers (G. and T. Earle, Ltd.). The total value of the orders is over £120,000.

### **NEW COATINGS DIVISION**

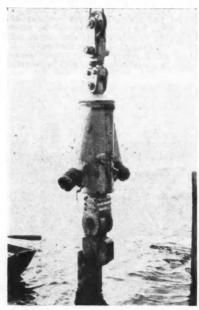
Corrosion Technical Services, Ltd., Sunleys Island, Great West Road, Brentford, Middx., have formed a new Coatings Division for the manufacture and application of chemical-resistant coatings and linings. The division will undertake complete preparation, including shot-lestings and application of linings and blastings, and application of linings and coatings to chemical plant, vessels, pipeworks and ducting.

### SAXTON BACK IN LONDON

Saxton and Co. (London), Ltd., as the Saxton and Co. (London), Ltd., as the initial stage in a big expansion programme, are moving their main offices from Uxbridge back to London. As from January 8, 1962, their new London address will be 30 Woburn Place, London, W.C.1. Tel.: Langham 4525-8. Local depots at Manchester, Leeds, Darlington, Walsall and Bridgend remains as before and Bridgend remain as before.

### NEW DELMAG PILING PLANT ON MARKET

TWO new items have been added to the Delmag range of piling equip-ment marketed in this country by C. E. T. Plant, Ltd., Burlington Works, Abbey Road, London, N.W.10. These are the P.14 diesel pile extractor and the D.H.2 diesel pile driver.



Delmag P.14 pile extractor

The P.14 operates from a single rope crane and can cope with a wide range of piling. The number of blows is adjustable from 100 to 150 per minute with an adjustable blow energy of from 0 to 3,615ft./ lb. With an overall weight, without clamp,

lb. With an overall weight, without clamp, of 1.8 tons, fuel consumption of the unit is one gallon per hour.

The D.H.2 is a high pressure driver developed for light piling jobs such as trench sheeting and light sections of

### PRESS STUD SUSPENDED CEILINGS

A new invisible fixing method for suspended ceilings has been introduced by the Phoenix Timber Co., Ltd., Frog Island, Rainham, Essex.

Known as the "Harlow" ceiling, it is a development of the simple press stud system. "T" sections and "T" crosssystem. system, "T" sections and "T" cross-members prepunched with small circular holes make up a 24in. grid. The tiles or panels used for the ceiling are delivered to site with spring clips already fastened in position, and the panels are simply offered up and the spring clips pressed home into the holes in the cross-members.

### TURNERS ASBESTOS LONG SERVICE AWARDS

Certificates were presented to 56 employees of Turners Asbestos Cement Co., Ltd., by the chairman, Mr. Kenneth Neve, at the firm's recent annual long service dinner at Widnes.

This year a total of 102 certificates will be presented throughout the company's six factories. Awards are made for 40 years' and 25 years' completed service. In addition to the presentation of the long service certificates, an award of £250 is made to those who have completed 40 years and £100 to those who have completed 25 years.

### COSTAIN GROUP INTERIM REPORT

SIR RICHARD COSTAIN, chairman of Richard Costain, Ltd., indicates in his interim report for 1961 that the group trading profit for the year will be lower than that of 1960.

trading profit for the year will be lower than that of 1960.

Interim assessments, he states, show that the contract profits for the first six months of 1961 were not less than those for the corresponding period of 1960, but the incidence of higher interest charges following increases in the Bank Rate in July and the effects of the credit squeeze in the U.K., which are beginning to make themselves felt in certain sections of the group, such as house-building, will have an adverse effect on the group trading profits for the second half of 1961.

Sir Richard adds that indications are that the turnover for 1962 of the two main activities of the group, construction and civil engineering, should show some increase in 1961, and while it is early to forecast the final results for 1962, subject to their being no unforeseen circumstances, it is hoped that they will not compare too unfavourably with those of 1961, thereby enabling the current rates of dividend to be maintained.

be maintained.

### COMPANY'S PROFIT-SHARING **SCHEME**

Galliford and Sons, Ltd., contractors, Wolvey, Hinckley, Leics., have instituted in the last 12 months a scheme whereby their employees participate directly in the profits and success of the organisation. Benefits include sickness pay, life assurance, pensions and distribution in cash.

One quarter of the company's net profits are allocated to the schemes and the com-pany's accountants provide a statement certifying the profits to be transferred to the schemes. Two-thirds of the amount of the profit allocated are distributed to members under the profit sharing scheme, the other third is set aside for the pension,

life assurance, sickness and other schemes.
The cash is shared out on a "points" basis. Points are awarded for the amount of basic salary or wage and length of service and these points determine the amount of each members' share.

### CRANLEY FIXED-PRICE INDUSTRIAL BUILDINGS

Hewitt's of Cranleigh, Vine Works, Cranleigh, Surrey, have developed a new series of Cranley fixed-price standard industrial buildings, made from precast reinforced concrete.

reinforced concrete.

The first in the series is a building 120ft. long with a 40ft. clear span standing 9ft. 6in. to the eaves and giving a floor space of 4,800 super. ft. It costs £4,600 erected complete. Erection time from the receipt of the order is said to be six weeks. The asbestos roof has insulating lining, while the walls are infilled with insulated concrete blocks with an exposed aggregate finish. The concrete window surrounds concrete blocks with an exposed aggregate inish. The concrete window surrounds contain metal frames which are fully glazed. There is a total of 18 opening type metal windows. Sliding doors are placed as required and there are a single door at the rear and double doors for the entrance in the front, if required. All the joinery is primed, and complete with fittings, ready for final painting.

### THIXOTROPIC INDUSTRIAL PAINT

Detel Products, Ltd., Stonefield Way, Victoria Road, Ruislip, Middx., are soon to make available a new chlorinated rubber industrial paint called Thixochlor. This is said to combine the acid resistance properties of chlorinated rubber with the high film build associated with thixotropic formulation. film build formulation.

A thick coating of 0.008in, to 0.01in, can be applied in only two coats.

Trade and Company News

### EIMCO SELF-CONTAINED PACKAGED SEWAGE DISPOSAL PLANTS

AN efficient method of sewage disposal A for small communities, the self-contained packaged type of plant, is now being manufactured at Gateshead by Eimco (Great Britian), Ltd., an associate of the Eimco Corporation of America.

The plant works on the aerobic digestion principle and is manufactured in standard sizes with capacities ranging from 1,000 to 15,000 gallons per day. These models, in the ADR range, can be supplied as complete packaged units ready to install. The smallest type will handle the effluent from a hotel accommodating 20-25 guests, while the largest unit would be suitable for a holiday site with 150 family caravans. Sewage flows in excess of 15,000 gallons

per day can be processed by the larger ADC range. These models are too bulky for production as complete units. However, a maximum number of parts are prefabricated to simplify final assembly. The ADC range includes plants with capacities ranging from 20,000 to 200,000 gallons per day, the largest being capable of disposing of the effluent from a town of 4,000 inhabitants.

The tank of an Eimco-Process aerobic

Diagram of the Eimco Type ADR packaged sewage disposal plant

digestion plant is divided by a baffle into two compartments, one for aeration and the other for settling and clarification. Sewage or other waste enters the first tank and is aerated to encourage bacterial activity. It then flows to the second tank and is allowed to eattle and is activity. It then flows and is allowed to settle.

settled sludge The settled sludge is returned continuously to the aeration compartment for 24 hours of aeration regardless of intermittent flow to the plant. Clear and harmless overflow equal to the incoming flow is discharged from the top of the settling tank for final disposal.

tank for final disposal.

Continuous aeration of highly concentrated sewage and sludge encourages the growth of bacteria which oxidise organic matter present. In due time additional organisms break down any remaining sewage plus their own or other bacterial cell material into water, carbon dioxide, and stable ash. This process the logical extension of the activated sludge process to complete aeration, ensures that only biologically inert and inoffensive effluents are discharged.

are discharged.

The packaged units are built as rectangular tanks of reinforced in steel plate. Multiple coats of coal-tar paint and a magnesium electrolytic element give corrosion protection. Sewage enters the aeration tank through a removable bar screen, and is aerated by a motor-driven blower mounted above the tank. Air is dispersed through the sewage from Eimco patent non-clog diffusers having a long operating life. operating life.

operating life.

Aerated sewage passes to the settling tank through baffled ports which prevent excess turbulence, and an emergency bypass to the aeration tank prevents overflowing. Clear effluent leaves the settling tank past a scum baffle connected by an air lift to a scum well, thus preventing contamination of the final effluent by floating solids.

The larger versions of the plant are built on a circular plan with either steel or concrete tanks. The aeration compartment is arranged as an annulus, with the clarifi-cation compartment in the middle. The clarification compartment is equipped with a motor-driven sludge scraper to prevent sludge accumulation on the floor of the tank. On the top of this compartment a rotating scum skimmer collects scum for return to the aeration compartment.

### **BRITISH STANDARDS**

### Universal Decimal Classification — Abridged English Edition

THE fact that a third edition of B.S. 1000A (B.S. 1000A: 1961) has just been published within five years of the last one is evidence of a serious attempt by the British Standards Institution to keep the U.D.C. abreast of scientific and technical educates. nical advances.

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nical advances.

It is also evidence, and no doubt partly in consequence, of a growing number of abrents such as documentation centres, special libraries and information sections of scientific and industrial organisations where a standard ready made system of classifying and filing documents and reference to the literature is recognised as cassiying and filing documents and reference to the literature is recognised as the best way to ensure rapid, efficient retrieval of any information sought. For despite the tendency towards specialisation,

despite the tendency towards specialisation, it is becoming increasingly desirable in almost every branch of science and industry to keep abreast of important advances in other special fields and to law information readily available on the seneral, economic, political and cultural trends not only in our own country but throughout the world. This is where the miversal approach of the U.D.C. comes into its own, as distinct from the more instricted approach of the many special dassification systems in use.

Detailed documentation does, of course.

Detailed documentation does, of course, liquire the use of the full published tables, of such full drafts as are available, but publication of B.S. 1000 section by section

is a slow process: the best means to ensure that U.D.C. users are kept up to date is the issue at regular five-yearly intervals of a new edition of the abridgement which lists, if only in outline, the main changes since the previous one.

The latest edition contains, among other medifications completely new sections on

The latest edition contains, among other modifications, completely new sections on nuclear physics and technology, geodesy and surveying, glaciology, frozen ground, ice and snow engineering, plant damage and pest control, forestry, management, and textile finishing, while some of the more thoroughly revised sections include analytical chemistry, electronics and semiconductor devices and telecommunications engineering.

engineering.
These and many other changes, together with a number of footnotes under relevant sections referring to further revisions imminent, are listed in a separate summary at the beginning of the new edition while cancelled number (with relocations indicated) are again, as in the second edition, printed in small type in the tables themselves with marginal asterisks. The very detailed alphabetical index with over 20,000 items has also been revised to take account of the many changes scheduled. Price £3 bound, £2 15s. unbound. Copies of this British Standard may be

obtained from the British Standards Insti-tution, Sales Branch, 2 Park Street, London, W.1.

### TWO-CAR CONCRETE GARAGE BY MARLEY

Marley Concrete, Ltd., Sevenoaks, Kent, are marketing a two-car precast concrete garage which, supplied and erected by the company, costs £207.

Called the Majestic, it is available in standard lengths from 14ft. lin. to 22ft. 4in. and 17ft. 2in. wide externally. If required it may be further extended in length by multiples of 1ft. 4in.

The garage has a Western red cedarwood fascia. Twelve fixed windows, each about 2 sq. ft. in area are standard and may be located in any wall. The self-bracing precast concrete wall panels are reinforced with steel rods. They have integral tongued and grooved weather joints, and in addition all nuts, bolts, etc., are rust resistant.

joints, and in addition all nuts, bolts, etc., are rust resistant.

The main doors are of the sliding type; running in an overhead track with guide rails at the bottom. They are constructed of mahogany faced panels. The roof is Watford Tile asbestos cement sheeting fixed to timber purlins, which are carried on intermediate steel rafters and Cuprinol treated timber trusses at the gable ends.

### ORDER FOR IH OF AUSTRALIA

The International Harvester Company of Australia have won an order from Singapore for the supply of 35 small earthmoving machines and more than 30 bulldozer blades at a total cost of more than £A66,000. During the trading year ended last October the Company sent machinery worth £A19,250,000 to 81 countries.

### Trade and Company News

### **NEW COMPANIES**

The undermentioned particulars of new companies recently registered are taken from the daily register compiled by Jordan and Sons, Ltd., company registration agents, 116 Chancery Lane, London,

Midland and Bucks. (Construction), Ltd., Station Fields, Mursley, Bucks., building contractors. £1,000. Directors: Arthur H. Cooke, Hundred Elms Farmhouse, Elms Lane. Wembley; James J. Bird, 29 Warners Road, Newton Longville, Bletchley.

Newton Longville, Bletchley.

Edmund Kenyon (Painters and Decorators),
Manchester, Ltd., 5 Mount Pleasant, Manchester, £100. Director: Edmund Kenyon, 1
Chandos Road., Prestwich.

Athol Construction Co., Ltd., building contractors, £4,000. Directors: William P. Brown and Mrs. J. Brown, 5 Athol Park, Hendon, Sunderland.

and Mrs. I. Brown, 5 Athol Park, Hendon, Sunderland.

J. E. Davies (Builders), Ltd. £1,000. Directors: John E. Davies and Doris A. Davies, 5 Edward Street, Abertillery.

E. Hodgkiss, Ltd., 12 Parkstone Road, Poole, Dorset, builders and contractors. £3,000. Directors: Enoch Hodgkiss and Mrs. A. Hodgkiss, 10 Upwey Avenue, Hamworthy, Poole.

A. W. Clare and Sons, Ltd., builders. £1,000. Directors: Alfred W. Clare and Mrs. S. 1, Clare, 42 Woodlands Avenue, Gorton Manchester, 18.

Noel Dixon, Ltd., builders. £100. Directors: Noel Dixon and Mrs. S. F. Dixon, 1 Durrell Road, S.W.6.

James E. Cox (Highcliffe), Ltd., building and public works contractors. £1,000. Directors: lames E. Cox (permanent) and Jessie M. Cox, Jay's Court, Montagu Road, Highcliffe, Hants. G. B. Homes, Ltd., 937a Brighton Road, Purley, Surrey, builders. £1,000. Directors: Ronald F. Blackiston, 9 Glen Close, Wannock, Polegate, Sussex; Herbert G. Goodchild, 15 Leechcroft Road, Wallington, Surrey. Carpenter and Boorer, Ltd., "Brooklea," Carpenter and Boorer, Ltd., "Brooklea," Carpenter and Boorer, Ltd., "Brooklea," Estitish Voung (Builders), Ltd., £2,000.

Cross,
Arthur Young (Builders), Ltd. £2,000.
Directors: Edith E. Young, 17 Cable Road,
Hoylake; Thomas R. Langley, 24 Cranbourn
Avenue, Meols.
Pewsey Vale Builders, Ltd., 2 Sidmouth
Street, Devises. £1,000. Directors: Arthur
P. B. Scott, Marden Grange, Marden, near
Devises; Edward J. P. Carter, Cedarwood,
The Breach, Devises.

Edward Pearce (Looe), Ltd., builders. £2,000. Directors: Edwin Pearce and Mrs. L. Pearce, Westnorth, Sandplace Road, East

£2,000. Directors: Edwin Pearce and Mrs. L. Pearce, Westnorth, Sandplace Road, East Looe.
A. E. Knights (Chapel), Ltd., 84 Market Street, Chapel-en-le-Frith, Derbys., public works contractors, plant hirers, etc. £10,000. Directors: Archibald E. Knights (permanent) and Mrs. Phyllis Knights, 293 Lodgett Lane, Leeds: Rita Furniss, 84 Market Street, Chapel-en-le-Frith)

en-le-Frith.

Chartridge Builders, Ltd., The Bungalow, Chapel Lane, Chartridge, Bucks. £1,000. Subscribers: Wm. G. Pearce, The Bungalow, Chapel Lane, Chartridge; Dennis R. Pearce, 3 Chartridge Green Bungalow, Chartridge,

Chartridge Green Bungalow, Chartridge, Chesham.
P. H. Linford, Ltd., Hascombe, Brooklyn Road, Woking, building contractors. £500. Directors: Peter H. Linford, 69 East Hill, Maybury, Woking.
F. and W. Bugden Bros., Ltd., 165 Harefield Rd., Uxbridge, Middx., builders. £100. Permanent directors: Walter Bugden, 17 Bedford Road, Ruislip: Federick W. Bugden, 64a The Greenway, Uxbridge.
C. G. Lennox, Ltd., 288 Collier Row Lane, Collier Row, Romford, builders. £500. Directors: Colin G. Lennox, 29 Boxmoor Road, Collier Row Romford; John E. Fagg, 345 Burgess Road, E.6.
George Jenkins (Demolitions), Ltd., 38 Gt. Portland Street, W.1. £100. Directors: George A. Jenkins, 11 Plain Street, S.E.26: Walter Brown, Jalma, Stevens Lane, Claygate; Bernard J. Burgess.
Geff. Stockdale and Sons, Ltd., builders. £1,000. Directors: Geoffrey Stockdale and Nancy Stockdale, 65 Cobwell Road, Retford, Notts.
White and Usher, Ltd., builders. £2,500. Directors: Arnie White, 30 High Street, Staple Hill, Bristol; Stanley H. Usher, Therstan, Gerrish Avenue, Downend, Bristol; Gordon Upton.
S. and F. Building Contractors, Ltd., 2

Gerrish Avenue, Downend, Bristol; Gordon Upton.
S. and F. Building Contractors, Ltd., 2 Doncaster Road, South Elmsall, near Pontefract. £1,000. Directors: Jack Saul, 7 Grosvenor Avenue, Upton, near Pontefract; Reville H. Fulwood, Doncaster Road, South Elmsall. Callid Construction, Ltd., 6 Christina Street, Swansea, builders and general and public works contractors. £5,000. Directors: Anthony T. Watkins, 6 Bryn-y-mor Crescent, Swansea. Winkins-Saunders, Ltd., Landgate Chambers, Rye, Sussex, builders. £100. Directors: Roy K. N. Wilkins, 24 Cadborough Road, Rye: Sydney C. Saunders, 13 Sutherland Avenue, Biggin Hill, Kent; Mrs. Evelyn E. Wilkins and Mrs. Winifred K. Saunders.

### POWER SOURCE FOR CO2 WELDING

A MOBILE power source for use with automatic CO2 welding processes has been developed by Lincoln Electric Co., Ltd., Welwyn Garden City, Herts., and now being marketed as the Lincoln CVR.200 constant voltage selenium plate D.C. recti-

Basically the unit is a three-phase natural air-cooled constant voltage transformer rectifier providing a voltage range of 14-30-V D.C. and a continuous crage fier.
Basically the of 14-30-V D.C. and a continuous output of 200 amps D.C. at 25-V (5kW), with an input of 415-V. Fine voltage selection is provided in a series of 16 steps ensuring accurate voltage control to meet any arc characteristic.

characteristic.

The required voltage is selected by means of two selector switches, one giving coarse selection and one giving fine selection, the combination of which enables the required voltage to be selected in steps of approximately 1-V. A special variable stabiliser ensures a smooth arc characteristic and gives any added inductance necessity. gives any added inductance necessary to minimise spatter loss.

The CVR.200 is of all-welded steel con-

The CVR.200 is of all-welded steel construction and is mounted on castors with 5in. diameter hard-rubber wheels. In addition to the standard unit, a special version combining the CVR.200 with the Lincoln Sprite CO2 welding unit has been developed with the Sprite unit mounted on a special turntable on top of the CVR.200.

### FORDSON TRACTOR PRODUCTION RECORD

Total production of tractors at Ford's Dagenham factory reached an all-time peak during the 11 months ended Novem-ber 30, 1961, and in the 10 months ended October 31, total sales surpassed last year's

all-time record for the same period.

In the 11-month period 66,202 Fordson tractors were produced, against 66,080 last

The 10-month sales review shows that

The 10-month sales review shows that the Tractor Group is now conducting 54.6 per cent. of its total export business with Europe as against 43.0 per cent. in 1960. Home sales have gone up by 9 per cent. The U.S.A. is still the foremost importer of British-built Fordsons. They increased their purchases by over 4 per cent., from 4,359 to 4,542. Finland moves up from third place in 1960 to second in the 1961 "big five" buyers' list. France is third, Denmark fourth and West Germany fifth.

### TRADE NEWS IN BRIEF

Copies of a new catalogue dealing with Unilux translucent sheeting are available from the U.A.M. Group Advisory and Information Service, Tolpits, Watford.

John Bedford and Sons, I.td., Sheffield, 5, have published a catalogue dealing with their drill rods, detachable bits, drill stems, mining steels and pick steels. Details of the resharpening of these tools, together with heat treatment instructions and qualities of various bar steels, are also given.

New technical leaflets produced by Permanite, Ltd., 455 Old Ford Road, London, E.3, deal with dampcourses and Permatile and Permasul built-up felt roofing systems.

Lincoln Electric Co., Ltd., Welwyn Garden City, Herts., have produced a new edition of their Weldirectory of Lincoln Arc Welding Equipment, Electrodes and Accessories. It contains 10 indexed sections in a loose-leafed binder.

From The Ruberoid Co., Ltd., 1,19 New

contains 10 indexed sections in a loose-leafed binder.

From The Ruberoid Co., Ltd., 1-19 New Oxford Street, London, W.C.I, a copy of their new Built-up Roofing Catalogue.

General Steel and Iron Co., Ltd., have opened new offices at 30-32 Mortimer Street, London, W.I. Tel.: Langham 4741 (10 lines).

Full details of the standard architectural sections produced by James Booth Aluminium, Ltd., Kitts Green, Birmingham 33, have been issued by the company in the form of a sixpage folder, to international paper classification A4 and SfB.

Thos. W. Ward, Ltd., Albion Works, Sheffield, have produced a new booklet on their Douglas Automaster 22-ton dump truck. New offices and joinery works have been opened at Plymouth Road, Blackpool, by R. Fielding and Son (Builders), Ltd.

From Crypton Equipment, Ltd., Bridgwater, Somerset, a copy of their latest publication—the Manual of Battery Tune-up.

An illustrated booklet describing their new automatic coated macadam plant at Shap, Westmorland, has been published by Tarmac Roadstone, Ltd., Ettingshall, Wolverhampton, Semtex, Ltd., Ettingshall, Wolverhampton, W.1, have introduced a new range of 16 colours in their top-grade Semflex flooring.

The Chamberlain Group of Companies, 3 Buckingham Palace Gardens, London, S.W.1, report that their new subsidiary, Sanders and Forster (Caribbean), Ltd., Port of Spain, Trinidad, are now producing structural steel-work at their Arima Works.

United Dominions Trust's branch office in Canterbury has been moved to new premises in 8 Rose Lane.

The Mono Concrete Co., Ltd., West Drayton, Middlesex, have produced a new leaflet on the disposal of surface water by precast concrete soakaways. A feature is a section giving information on storage capacity in relation to ground area.

Chipman Chemical Co., Ltd., have moved

information on storage capacity in restaurance ground area.

Chipman Chemical Co., Ltd., have moved their offices to Horsham, Sussex.

As from January 1, the address of the British Granite and Whinstone Federation will be 16 Berkeley Street, London, W.1 (Tel: Hyde Park 3392).

George Cohen Sons and Co., Ltd., announce that their engineers' tools department has moved from 25-29 Bulwer Street, London, W.12, to the company's new machine tool W.12, to the company's new machine tool

moved from 25-29 Bulwer Street, London, W.12, to the company's new machine tool headquarters at 23-25 Sunbeam Road, London, N.W.10. Tel.: ELGar 7222.

Copies of a new booklet, "The Application of 'Namastic' Asphalt for Tanking", are available free from the National Association of Master Asphalters, 9 Clarges Street, London, W.1.

An illustrated brochure describing their site cabins has been published by Armitage Units, Ltd., Ogden Street, Salem, Oldham, Lancs.

### CONTRACT FOR FURNACE SLAG PLANT

SLAG PLANT

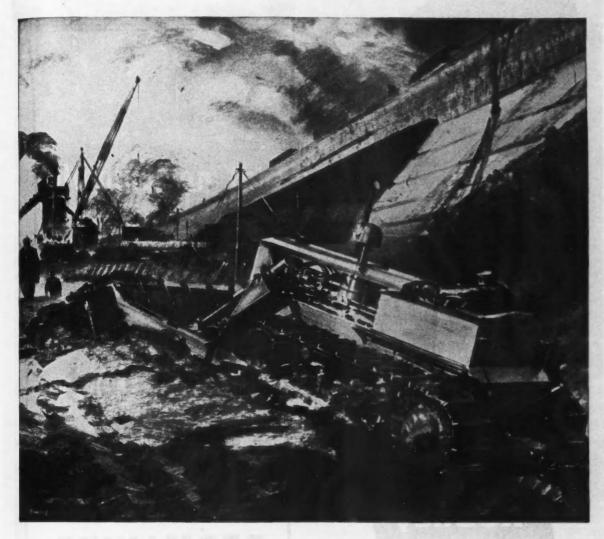
The contract for the blast furnace slag processing plant at the Spencer Works of Richard Thomas and Baldwins, Ltd., Llanwern, near Newport, Mon., has been awarded to Stothert and Pitt, Ltd., Bath. The plant has been designed to deal with blast furnace slag at the rate of 350 tons an hour at first, and later to be capable of extension to cope with 700 tons an hour. It incorporates a coated macadam unit capable of producing 120 tons an hour of coated slag, and is equipped with devices for the production of accurately graded and mixed material to any desired specification. Sales of the finished products from the plant will be undertaken by Llanwern the plant will be undertaken by Llanwern Slag Products, Ltd., which is associated with Hobbs (Quarries), Ltd.

### NEW GROUTING COMPANY

Intrusion-Prepakt, Inc., of Cleveland, U.S.A., announce the formation of an associate company in this country. Intrusion-Prepakt (U.K.), Ltd.

The company will specialise in the injection of cement, sand-mortar and grout the provide when a sand-mortar and grout the provide such assurance as underwater.

to provide such services as underwater concreting, pier foundations, stabilisation of loose sands beneath bridges, consolida-tion of ballast stratas, etc. In addition Intrusion - Prepakt equipment enables cement and sand-mortar to be injected directly into preplaced aggregate for the production of concrete.



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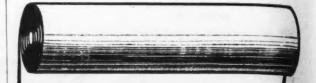
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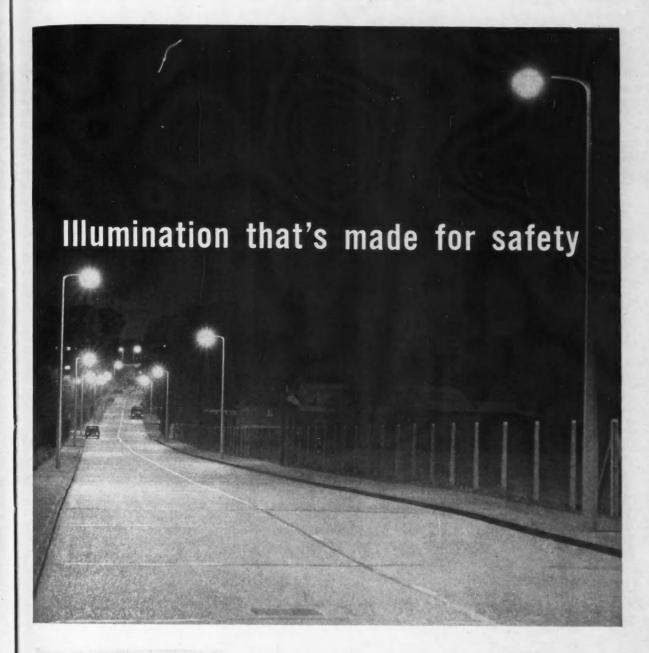
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The excellent illumination given by these Philips MBF/U 250-watt lamps ensures maximum safety for all road users. They provide excellent visibility . . . reduce the risk of accident. The efficiency of this lighting is matched by the efficiency and modern styling of the Eleco Silver Ray Lanterns in which they are housed, and the HW.820 Elecoslim columns that support them. This is just one more of the many successful street lighting schemes carried out by these two famous companies – Philips and Eleco. Their long experience is available to you at any time.

Lighting installation in Roding Lane, Wasshad, Photographs by kind parmission of L. S. Jeffery, Esq., A.M.I.C.E. M.I.Mun.E. A.M.I.Stuct.E. Engineer & Surveyor of the Wanstead and Woodford Barough Council.

PHILIPS ELECTRICAL LTD Lamp & Lighting Group

CENTURY HOUSE - SHAFTESBURY AVENUE - LONDON WC2



(TD2280A)

# BRISTOL CRAWLER TRACTORS



### SALES AND SERVICE ORGANISATION

BIRTLEY, CO. DURHAM H. N. Marsh & Co. Ltd.

MANCHESTER

KEIGHLEY

WORGESTER

C & A Plant Services Ltd.

E. Foulds (Motor Engineers) Ltd.

H. A. Saunders Ltd.

RADLETT (HERTS)

**CREDITON (DEVON)** 

BELFAST

DUBLIN

H. A. Saunders Ltd.

H. A. Saunders Ltd.

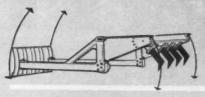
McNeill (Engineering) Ltd.

McNeill (Ireland) Ltd.

**GLASGOW** 

Thomas Cochran Co. Ltd.

# world's finest light earthmovers



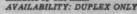
The Mounted Ripper for the Bristol Duplex Model is attached by 4 pins to the main dozer frams in a few moments and is supplied with 4 tines. This enables the double operation of Ripping and Dozing to be carried out without any change of equipment.

AVAILABILITY: DUPLEX ONLY



The Skate built-in road transporter gear is hydraulically operated by the tractor itself and permits the machine to be raised on road wheels for quick transportation behind a lorry. The road wheels are fitted or removed in a few minutes by one man.

AVAILABILITY: DUPLEX ONLY



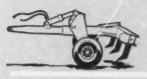


The Bristol Angledozer equipment provides for both Angling and Tilting. The blade may be employed straight for bulldozing or angled approximately 30° to left or right. For cambering or initial outs into hard surfaces, the blade can be tilted to left or right. AVAILABILITY: ALL MODELS



The 2 cu. yard (1.53 M³) Hydraulic Scraper weighs I ton (1016 kgs.) operates from the standard hydraulic system of the Bristol tractor—and can be attached or detached in I or 3 minutes, no extra equipment being required.

AVAILABILITY: ALL MODELS

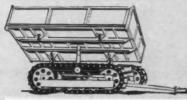


rloade TILITY

) Ltd.

The Hydraulic Ripper weighs only 10 cwts. (508 kgs.) and operates from the standard hydraulic system of the Bristol Tractor. It is supplied with 4 tines which can be employed for Ripping. Rooting, and Subsoiling.

AVAILABILITY: ALL MODELS



The Soft Land 3-way hydraulic tipping trailer is available as a bare chassis or with steel body. The carrying capacity is 5 tons and the 16 inch (40 cms.) trank plates provide very low ground pressure. The track parts are of standard Bristol type.

AVAILABILITY: ALL MODELS OR ANY TRACTOR WITH HYDRAULIC SYSTEM



Terrier Trencher Connect to or disconnect from the Bristol Tractor in a few minutes without other equipment. Digs to 12ft, deep x 3ft, wide with a wide range of buckets for trenching, clay, face shovel and general purpose excavation. AVAILABILITY: DUPLEX OR EUROPA

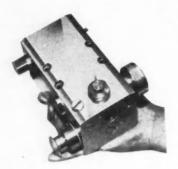
### H. A. SAUNDERS LIMITED

INDUSTRIAL TRACTOR DIVISION 836-842 HIGH ROAD, NORTH FINCHLEY, LONDON N.12 TEL: HILLSIDE 8822 (15 LINES) Grams: Dutrax, London N. 12

# MAIN







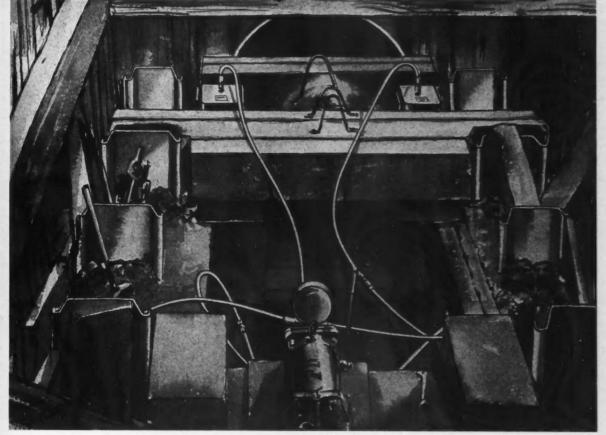
When engineers need pressures of several hundred tons to answer their demands in large presses, bridge building or lifting, jacking or moving great weights, then oil or water hydraulic pressures come readily to mind. The magnified power of hydraulics is practically limitless yet is simply and precisely controlled. Tangye's have more than a century's experience in putting hydraulic power to work.



Tangy e

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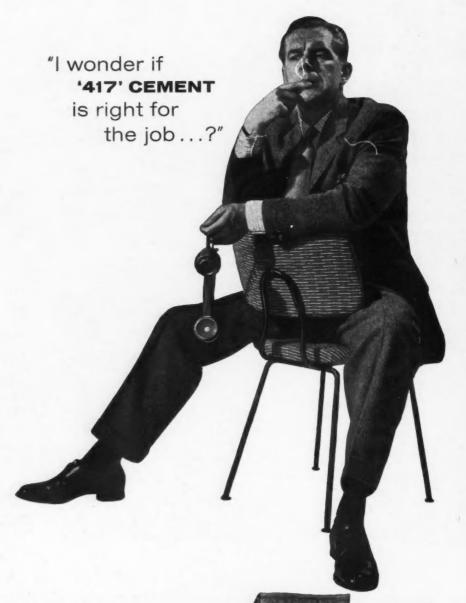
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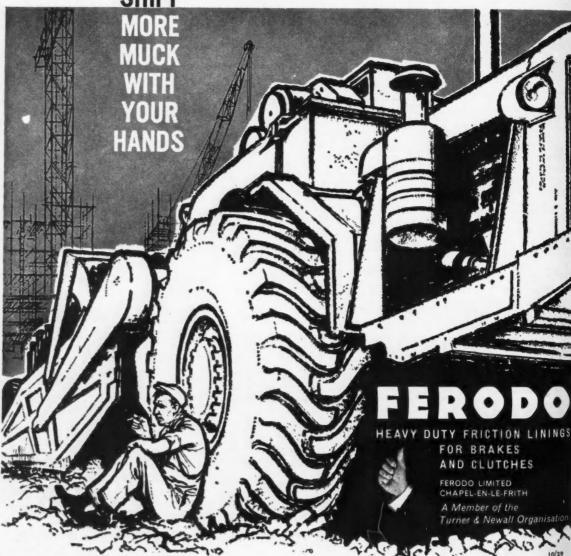


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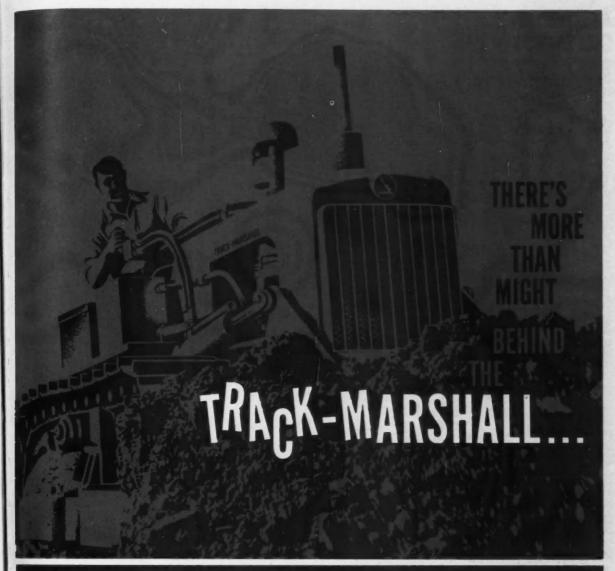
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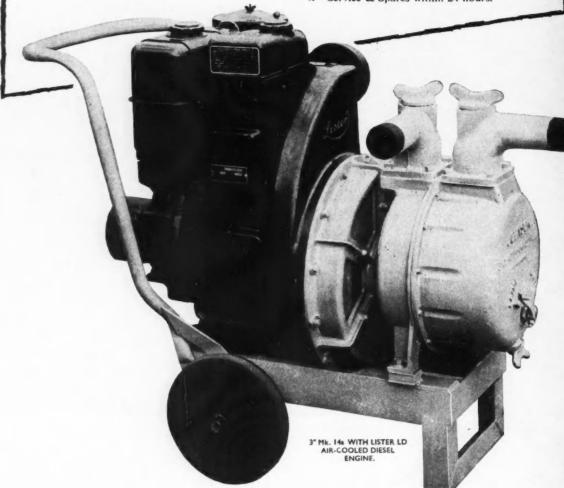
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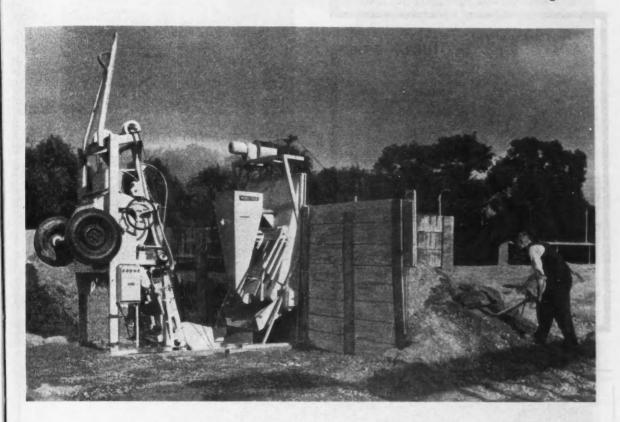
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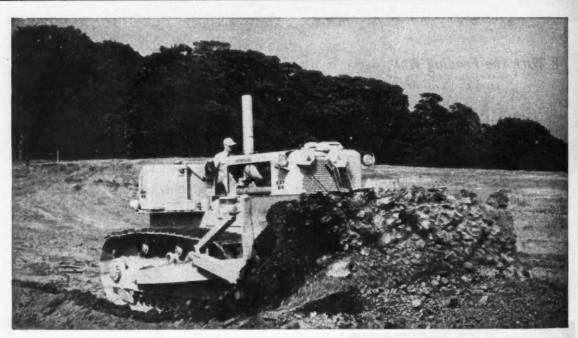
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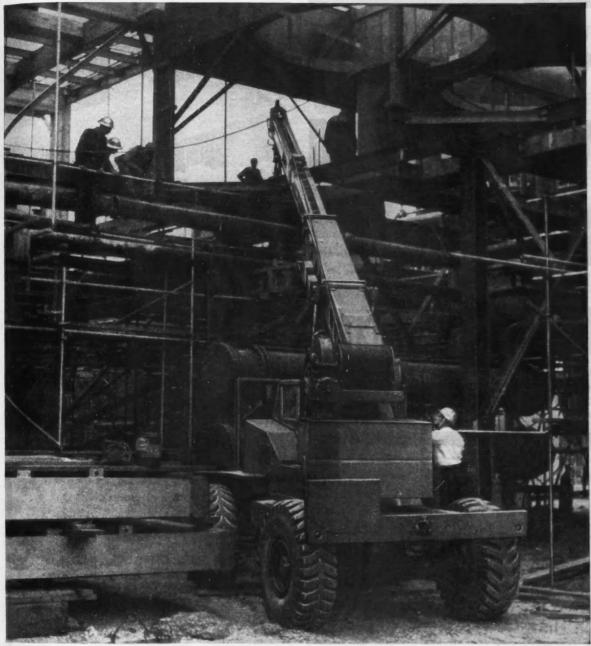


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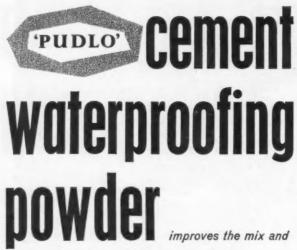
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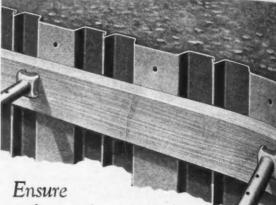


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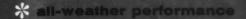
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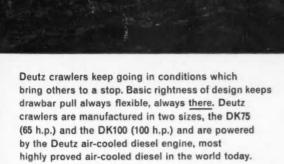
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